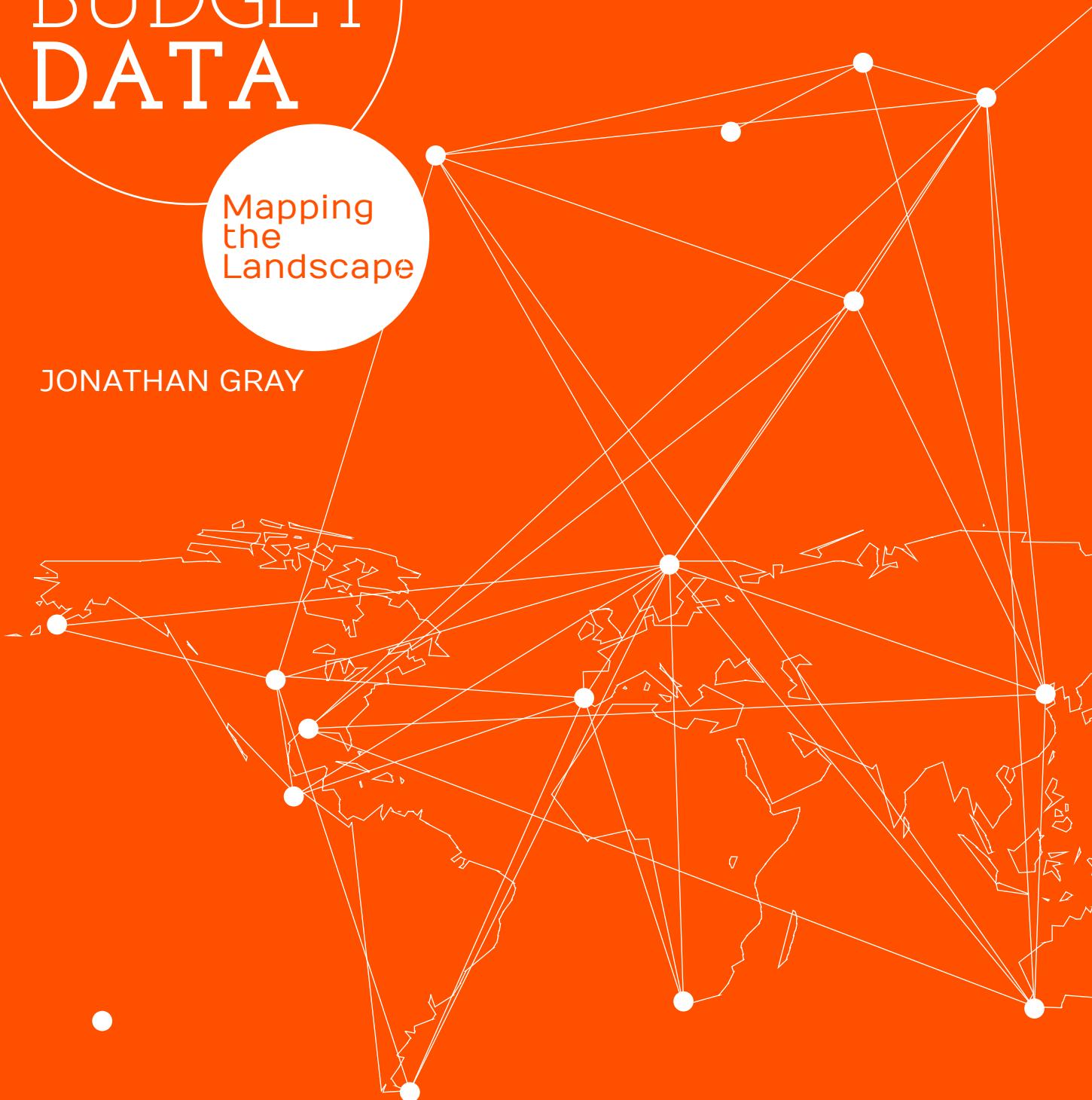


OPEN BUDGET DATA

Mapping
the
Landscape

JONATHAN GRAY



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Open Knowledge is a global civil society organisation dedicated to opening up public information, research and culture to benefit the lives of citizens around the world. Find out more at: okfn.org.

The Digital Methods Initiative at the University of Amsterdam is one of Europe's leading research groups looking at how traces from digital media can be used to understand culture and society. Find out more at digitalmethods.net.

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CONTENTS

Executive Summary	3
Summary of Recommendations.....	4
Landscape Mapping and Analysis.....	5
The “Digital Methods” Approach	5
1. Definitions	6
Existing Definitions of Open Budget Data.....	6
The Openness of Open Budget Data?	7
What Kinds of Information Does “Budget Data” Include?	9
Synthesised Definitions.....	11
2. Best Practices	12
3. Actors	18
Starting List of Actors Around Open Budget Data	18
Hyperlink Analysis of Actors Around Open Budget Data	19
Actors Around Open Budget Data on Twitter.....	21
Actors Around Open Budget Data in Search Engine Results	24
Key Findings.....	27
4. Issues	28
Review of Arguments in Existing Literature on Financial Transparency.....	28
Mapping Issues and Arguments for Open Budget Data in Digital Media.....	31
Key Findings.....	36
5. Initiatives	38
Data Visualisations to Increase Public Understanding of Public Finances	39
Citizen Budget Monitoring	45
Following the Money in Journalism.....	47
Data for Advocacy	50
Findings	51
Conclusions and Recommendations.....	52
References	54
Appendix	60
Methodology	60
“Search as Research”	60
Hyperlink Analysis	61
Twitter Data	61
Starting Lists of Actors	63
List of Initiatives from Mapping	64

EXECUTIVE SUMMARY

How public money is collected and distributed is one of the most pressing political questions of our time, influencing the health, well-being and prospects of billions of people around the world. Decisions about fiscal policy affect everyone - determining everything from who pays how much tax, to the resourcing of essential public services such as schools and hospitals, to the capacity of public institutions to take action on global challenges such as poverty, inequality or climate change.

Digital technologies have the potential to transform the way that information about public money is organised, circulated and utilised in society, which in turn could shape the character of public debate, democratic engagement, governmental accountability and public participation in decision-making about public funds. Data could play a vital role in tackling the democratic deficit in fiscal policy and in supporting better outcomes for citizens.

This report offers an unprecedented empirical mapping and analysis of the emerging issue of open budget data, which has appeared as ideals from the open data movement have begun to gain traction amongst advocates and practitioners of financial transparency. It is based on an "issue mapping" study utilising digital tools and methods pioneered at the University of Amsterdam, accompanied by an extensive review of existing literature from both researchers and practitioners.

In the following pages we chart the constellation of definitions, best practices, actors, issues and initiatives associated with the emerging issue of open budget data in different forms of digital media – from social media platforms to search engine results. In doing so, our objective is to enable practitioners – in particular civil society organisations (CSOs), intergovernmental organisations (IGOs), governments, multilaterals and funders – to navigate this developing field and to identify trends, gaps and opportunities for supporting it.

Through this research we found have that there is relatively strong consensus around definitions and best practices for open budget data. Its most visible stakeholders are international organisations – including IGOs and global CSOs. Amongst the wide variety of different issues and arguments associated with it, the most popular are technical in nature. Data visualisation appeared to be the most prevalent genre of usage in the sample of initiatives that we examined.

We also found that more substantive social and political issues around fiscal policy (from tackling inequality to tax justice) appear to be comparatively marginal in the field of open budget data. The range of civil society groups represented remains limited to mainly larger international organisations, with much sparser representation from local groups or organisations who are not mainly focused on transparency in their work. Explicit "accountability paths" and theories of change appear to be relatively under-developed. Hence we propose the following recommendations.

SUMMARY OF RECOMMENDATIONS

1. CSOs, IGOs, multilaterals and governments should undertake further work to **identify, engage with and map the interests of a broader range of civil society actors** whose work might benefit from open fiscal data, in order to inform data release priorities and data standards work. Stronger feedback loops should be established between the contexts of data production and its various contexts of usage in civil society – particularly in journalism and in advocacy.
2. Governments, IGOs and funders should support **pilot projects undertaken by CSOs and/or media organisations** in order to further explore the role of data in the democratisation of fiscal policy - especially in relation to areas which appear to have been comparatively under-explored in this field, such as tax distribution and tax base erosion, or tracking money through from revenues to results.
3. Governments should work to make data "**citizen readable**" as well as "**machine readable**", and should take steps to ensure that information about flows of public money and the institutional processes around them are accessible to non-specialist audiences – including through documentation, media, events and guidance materials. This is a critical step towards the greater democratisation and accountability of fiscal policy.
4. Further research should be undertaken to explore the potential **implications and impacts of opening up information about public finance which is currently not routinely disclosed**, such as more detailed data about tax revenues – as well as measures needed to protect the personal privacy of individuals.
5. CSOs, IGOs, multilaterals and governments should work together to **promote and adopt consistent definitions of open budget data, open spending data and open fiscal data** in order to establish the legal and technical openness of public information about public money as a global norm in financial transparency.

LANDSCAPE MAPPING AND ANALYSIS

THE “DIGITAL METHODS” APPROACH

In this report we use “digital methods” to map open budget data as an issue on different forms of digital media. The digital methods approach repurposes digital objects such as links and likes, hyperlinks and hashtags in order to analyse the composition of social, cultural and political issues (Rogers, 2013a). It has been used extensively by researchers, civil society organisations and others to help them to understand the reception and constitution of issues that they work on – from global health to global warming, human rights to far right extremism, protests to revolutions. It is especially well suited to exploring issues which are “born digital” or which are highly digitally mediated, which we believe to be the case with open budget data.

Through our issue mapping study using tools and methods developed at the Digital Methods Initiative we have been able to obtain an unprecedented picture of many of the actors, initiatives, issues, definitions and best practices associated with open budget data on digital media. This has enabled us to gain an understanding of how different actors are related, and about the prominence and marginality of different topics associated with open budget data in different countries and sectors.

Before walking through our findings and analysis we should say a bit more about the scope of our research so far and what can and cannot be concluded from it. Firstly, the mapping is clearly not exhaustive. We have largely restricted ourselves to publicly available digital traces from the web, social media and collections of documents. Many things will not be captured in our study – including communications which happen offline, through private digital channels or through sources which are not indexed or mediated through the platforms that we have examined.

Secondly, we have taken the phrase “open budget data” (and closely associated terms) as the point of departure for our mapping. Due to the relatively small scale of this project, we have not yet undertaken a mapping in other languages – though this could lead to some interesting geographical comparisons. Nor have we dedicated time to tracing the footprints of other digital objects associated with open budget data (whether datasets or data projects), though this would give valuable insights into the various publics and uses of fiscal data.

Thirdly and finally, the mapping should not be read in a manner which implies that it aspires to be directly representative of the field in the way that statistical samples are intended to be representative of a population. The field of open budget data is still nascent, and will continue to develop, evolve and spread. The present study is intended to give a fresh and extensive view of the state of the field at the time of writing to inform action and intervention. We hope it will encourage more practitioners to broaden the base of evidence upon which they depend in their work, as well as the repertoire of tools and methods which they use to obtain this.

1. DEFINITIONS

What is open budget data? Before going on to look at the actors, issues, initiatives and best practices associated with the issue, we will start out with some definitions.

The concept of “open budget data” draws on ideas and practices from two distinct but related areas: Open Government Data (OGD) and Open Budgeting. These two areas are in turn associated with broader fields such as Open Government and Open Development. Though they may sound very similar, each of these areas has a different conception of openness.

In this section we shall review some of the different understandings of the “openness” in “open budget data” that have been proposed by practitioners and researchers, and offer a synthesised definition drawing on previous work in this area.

There is a relatively high degree of consensus that the “openness” of open budget data refers to the legal and technical character of the disclosure of official information rather than the openness of official processes or institutions. Hence, it is essential that open budget data is seen as an instrument in relation to other broader social and political goals, rather than an end in itself.

EXISTING DEFINITIONS OF OPEN BUDGET DATA

From our issue mapping study and literature review, we found several explicit definitions of open budget data. Many of these explicitly refer to previous definitions of open data and open government data. One of the earliest that we found was in a report from a group of researchers at Zeppelin University in Germany titled “Open Budget 2.0 and Open Budget Data” (von Lucke, Geiger, Hoose, & Schreiner, 2011), in which open budget data is defined as follows:

[Open budget data] are datasets of financial management in the public sector which are made available by the state and public administration to be freely used, redistributed and re-used without restriction.¹ (p. 12)

The authors highlight the Sunlight Foundation’s “Ten Principles for Opening Up Government Information” (Sunlight Foundation, 2010), as well as stipulating that their definition would include budget data, financial management information, budget documents, and budget reports without personal information. This report is widely cited on the web by German language sources, along with other reports and presentations by Professor von Lucke and colleagues.

¹ Author's own translation.

² Research papers mentioning open budget data that refer to these definitions and guidance materials include: Fioretti, 2010; Beghin & Zigoni, 2014; Boyera & Iglesias, 2014; Mejabi, Azeez, Adedoyin, &

Another definition is proposed by the authors of a major study commissioned by the World Bank called *Financial Management Information Systems and Open Budget Data: Do Governments Report on Where the Money Goes?* (Min & Dener, 2013):

For the purposes of this study, open budget data (OBD) is defined as the government budget data that are made accessible to the public (online) in editable (machine-readable) and reusable format, without any restriction (free/legally open). Requirements to protect the confidentiality of personal or classified information should be considered while posting open budget data. (p. 3)

The authors note that “public finance information” includes budget data as well as “other components of the government’s financial activities” such as “extrabudgetary funds, tax expenditures, quasi-fiscal activities, fixed assets [and] contingent liabilities” (p. 3). While they define financial transparency more broadly in terms of the “availability of meaningful information on fiscal policy and achievements”, budget transparency is focused on “the full disclosure of budget data on government revenues, allocations, and expenditures” and “ideally for the whole public sector” (p. 4). The report refers to existing open data principles and standards such as the Open Definition (Open Knowledge, 2014).

More recently the Global Initiative for Financial Transparency (GIFT) proposed the following definition of open budget data (Kemp, 2015):

Budget data are those quantitative values particular to an annual governmental budget. A budget can be segmented, in one view, according to given stages in the cycle: proposal, approval, adjustment, and execution (and another stage known as audit) of revenues and expenditures. The “open” part of the phrase indicates the data is published in a transparent manner such that others can easily access machine readable data with the ability to conduct analyses and transformations on that data.

This definition also included an explicit link to the Open Definition, as well as references to the global Open Data Day event and the International Open Data Conference.

THE OPENNESS OF OPEN BUDGET DATA?

In our literature review we found that many of the research publications that mentioned open budget data contained explicit references to open data and associated definitions and guidance, such as the Sunlight Foundation’s “Ten Principles”, Open Knowledge’s Open Definition, Tim Berners-Lee’s “Five Stars” of linked open data (Berners-Lee, 2010), the “8 Principles of Open Government Data” (Malamud, 2007), the Open Data Handbook (Open Knowledge, 2012) and other materials.² Several others explicitly alluded to the World Bank

² Research papers mentioning open budget data that refer to these definitions and guidance materials include: Fioretti, 2010; Beghin & Zigoni, 2014; Boyera & Iglesias, 2014; Mejabi, Azeez, Adedoyin, & Oloyede, 2014; Sapkota, 2014; Vlasov & Parkhimovich, 2014; Craveiro & Martano, 2015; Kim et al., 2015.

or Zeppelin University reports (see, e.g., Krabina, 2012; De Renzio & Simson, 2013). Only one paper we found alluded to open budget data in the sense of “data about open budgets”, rather than “open data about budgets”, such that the openness was predicated to the budgeting process rather than to the budget data (Harrison & Sayogo, 2013).

Similarly, we found that uses of the term “open budget data” on the web and social media were frequently accompanied by explicit discussion of open data. Open data appeared in over three quarters (76.7%) of search engine results for “open budget data”. It also emerged as the second most prominent hashtag in a collection of tweets obtained by querying the Twitter streaming API for key words and phrases associated with “open budget data”.

Hence on the basis of existing definitions, literature from practitioners and researchers and activity on digital media it appears that the “open” in open budget data is meant in the same sense as the “open” in open data, namely to indicate the legal and technical reusability of budget data. This can be contrasted with other senses of “open” - such as the openness of official processes or institutions through participation or accountability mechanisms. The table below illustrates a range of different meanings of openness in the transparency and accountability space - including open budgets, open contracting and open government.

Term	Disclosure of information?	Legal and technical reusability of data?	Citizen/civil society participation in official processes?	Accountability mechanisms?
Open Data Principles ³	Focus on manner of disclosure. Often less specific or prescriptive about what should be disclosed.	Required.	Not addressed.	Not addressed.
Open Budgets ⁴	Specific documents and datasets stipulated as required.	Not addressed.	Strongly encouraged.	Strongly encouraged.
Open Contracting Global Principles ⁵	Specific documents and datasets stipulated as required.	Data must be structured (as per Open Contracting Data Standard). Legal reusability not addressed.	Strongly encouraged.	Mentioned, but focus is on disclosure and participation.
Open Government Declaration ⁶	General presumption in favour of disclosure.	Encouraged but not necessarily required for all information.	Strongly encouraged.	Strongly encouraged.

³ Including Malamud, 2007; Sunlight Foundation 2010; Berners-Lee, 2010; Open Knowledge, 2012; Open Knowledge, 2014.

⁴ As discussed in, for example, International Budget Partnership, 2012a; Khagram, Fung, & de Renzio, 2012.

⁵ Open Contracting Partnership, 2013.

⁶ See Open Government Partnership, 2011 as well as Heller, 2012; Yu & Robinson, 2012; Transparency and Accountability Initiative, 2014. Other definitions are listed in Longo, Rogawski, & Young, 2013.

As with open data, open budget data is held to focus on the legal and technical reusability of information. While its proponents argue that it can be used in the pursuit of broader goals such as transparency, participation and accountability in public finances (as we shall examine in the following section), in most of the cases that we have examined the term “open budget data” appears to refer to legal and technical aspects of information disclosure as an enabler of a range of different potential outcomes, rather than referring to how this information is put to work *per se*. As such open budget data might be considered to be an *enabling component* of open budgeting, open contracting, or open government, standing in the service of these and other broader goals and outcomes without being confused with them. As Harlan Yu and David Robinson argue “open government and open data can each exist without the other” (Yu & Robinson, 2012, p. 181).

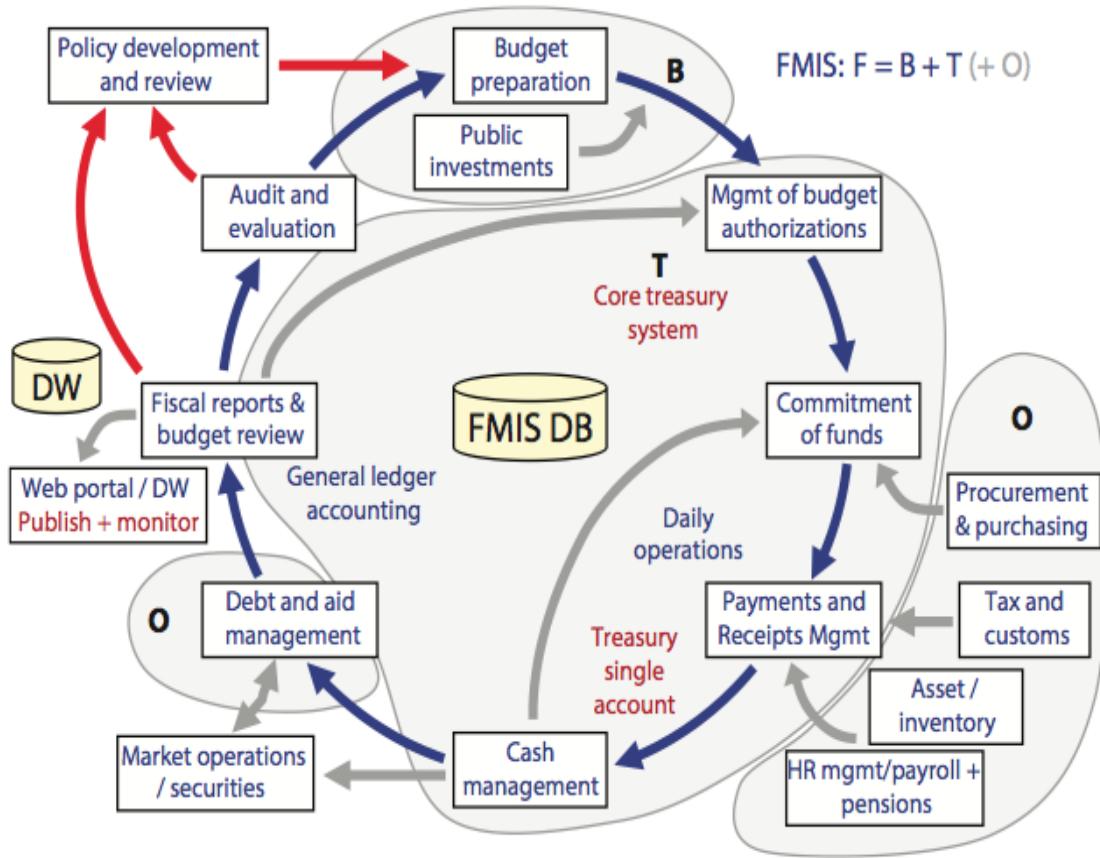
WHAT KINDS OF INFORMATION DOES “BUDGET DATA” INCLUDE?

After having looked at the “open” in open budget data, we can move on to clarify the kinds of budgetary information that the term is used to refer to. The following table recaps the relevant parts of the three definitions of open budget data that we noted above:

Definition of open budget data	Understanding of budget data
Zeppelin University (Von Lucke, Geiger, Hoose, & Schreiner, 2011, p. 12)	“datasets of financial management in the public sector”
World Bank (Min & Dener, 2013, p. 4)	“budget data on government revenues, allocations, and expenditures”
GIFT (Kemp, 2015)	“quantitative values particular to an annual governmental budget”

All three definitions refer broadly to information about public finances which is generated and used for planning, executing and evaluating the disbursement of public funds throughout the whole budget cycle. According to Min and Dener’s report for the World Bank, this may include transaction level data on expenditure insofar as this is relevant for different parts of the budgeting cycle. However, they stipulate that some information on public finance such as “extrabudgetary funds, tax expenditures, quasi-fiscal activities, fixed assets [and] contingent liabilities” is excluded from their definition of budget data (Min & Dener, 2013, p. 3). Their diagram giving an overview of the functions of financial management information systems, from which open budget data is derived, is reproduced below. Notably this differs from previous accounts which suggest that budget data tends to be highly aggregated, as opposed to spending data which is more granular (Open Spending, 2014).

Figure 1.2 Core FMIS functions and interfaces with other PFM systems



Source: World Bank data.

Note: For the purposes of this report, FMIS (F) is defined narrowly to include mainly core budget preparation (B) and treasury/budget execution (T) systems, complemented by other (O) modules in some cases. Arrows are used to indicate the linkages between core modules (blue), the interfaces with other systems (gray), as well as the links with policy development and review processes (red). The core FMIS functions and their contributions to PFM practices are more fully explained in Dener, Watkins, and Dorotinsky, 2011. FMIS DB = financial management information system database; DW = data warehouse; HR = human resources.

Diagram showing scope of Financial Management Information Systems (Min & Dener, 2013)

SYNTHEISISED DEFINITIONS

Drawing on the various definitions, accounts and understandings that we have examined in this section, we propose the following synthesised definitions which draw on and explicitly link to previous definitions of open data:

Term	Open data about...	Definition
Open budget data	Budget cycle	"Open budget data is public financial information used in the budget cycle that is freely available in a machine-readable format to use, modify and share (as per opendefinition.org)"
Open spending data	Public expenditure	"Open spending data is information about public expenditure that is freely available in a machine-readable format to use, modify and share (as per opendefinition.org)"
Open fiscal data	Public finance	"Open fiscal data is information about public finance that is freely available in a machine-readable format to use, modify and share (as per opendefinition.org)"

According to these definitions the term "open budget data" would cover information about public finance related to the budgeting cycle, "open spending data" would cover information about public expenditure, and "open fiscal data" would cover all information about public finance, including extrabudgetary funds and all forms of revenues, assets and liabilities. Following previous definitions, we have opted to keep these definition simple. Further discussion of other principles and best practices commonly associated with open data is included in the next section.

2. BEST PRACTICES

How should open budget data be done? In this section we survey best practices for open budget data, based on our digital mapping and a review of existing literature. As per the definitions in the previous section, best practice guidelines for open budget data tend to focus on the legal and technical aspects of the disclosure of fiscal information, rather than other aspects of fiscal transparency and open budgetary initiatives, more broadly conceived (as covered, for example, in the International Budget Partnership Open Budget Index).

Given that existing definitions of open data are extensively cited in association with open budget data in digital media and in existing literature, we summarise some of the most prominent ones, and the differences between them in the following table.

Definition	Date of Publication	Summary
Open Definition ⁷	October 2005	Inspired by the free/open source software and open access movements, and directly modelled on the Open Source Definition. The current version of the definition states that for a dataset to be open it must be able to be “freely used, modified, and shared by anyone for any purpose”, “subject, at most, to requirements that preserve provenance and openness”. It stipulates conditions that include legal openness, bulk downloadability and machine-readability.
8 Principles of Open Government Data ⁸	December 2007	Drafted by “30 open government advocates” in Sebastopol, California. They argue that “government data shall be considered open” if it is: complete, primary, timely, accessible, machine-processable, non-discriminatory, non-proprietary and license-free.
5 Stars of Linked Open Data ⁹	June 2010	Conceived by web inventor Tim Berners-Lee, the five stars stipulate that for data to be open it must be published under an open license, and preferably in a machine readable and non-proprietary format, adhering to open standards from W3C (such as RDF and SPARQL), and linking to other datasets.
Ten Principles for Opening Up Government Information ¹⁰	August 2010	The Sunlight Foundation’s revised version of the 2007 “8 Principles”, to “provide a lens to evaluate the extent to which government data is open and accessible to the public”. They modify and expand several of the 2007 principles and add two new principles on “permanence” and “usage costs”.

Drawing on these definitions and best practices for open data, several organisations have given sets of best practices for the publication of open budget data. In their World Bank report on *Financial Management Information Systems and Open Budget Data*, Cem Dener and

⁷ <http://opendefinition.org/>

⁸ https://public.resource.org/8_principles.html

⁹ <http://www.w3.org/DesignIssues/LinkedData.html>

¹⁰ <http://sunlightfoundation.com/policy/documents/ten-open-data-principles/>

Saw Young Min summarise their understanding of best practices for publishing data on public finance as:

"publishing extensive, reliable, and timely public finance information, drawn from an FMIS [financial management information system], on easy-to-navigate government websites with dynamic query and reporting options" (Min & Dener, 2013, p. 63)

They suggest a range of different indicators for measuring the status of fiscal information publication practices, which they group into four main categories: (i) the existence of a dedicated website for public financial data, (ii) the source and reliability of open budget data, (iii) the scope and presentation of public financial information, and (iv) the contents and regularity of public financial information. As per their definition that we examined above, they characterise open budget data as "online, editable/reusable, free" (p. 23). They also encourage "interactive query options for reports", including exporting data in formats such as "CSV, XLS, ODF, XML, PDF" (p. 22), as well as the publication of "details about underlying information systems" (p. 124). In explaining what they mean by the completeness of fiscal information they refer to the Open Budget Survey as well as to the IMF's Data Quality Assessment Framework for Government Finance Statistics. They also argue for the importance of historical data (p. 124-125). The authors present a range of financial transparency websites that they consider exemplary, accompanied by an analysis of their features.

It is also worth noting that as well as arguing for best practices for the publication of machine readable, technically and legally reusable data, they also argue that governments should help to make fiscal information more accessible and easy to understand for citizens - including through maps, applications and citizens' budgets. This is commensurate with Jonathan Fox's distinction between "clear" and "opaque" transparency (Fox, 2007). Fox argues that while the former takes steps to make information accessible to citizens, the latter may be more symbolic while leaving citizens none the wiser about the functioning of public institutions (Fox, 2007). In a similar vein, Bernhard Krabina argues that it is important that machine readability does not replace "human readability" when it comes to the disclosure of public information as open data, and public bodies should not feel relieved of the responsibility to make information accessible to citizens (Krabina, 2012). As David Heald contends:

There is no contradiction between making the main documents as user-friendly as possible and ensuring that necessary technical material is accessible to those wishing to delve further. (Heald, 2012, p. 45)

The Sunlight Foundation offers another set of recommendations for opening up financial information. They argue that governments should release a comprehensive list of financial datasets so that citizens, civil society groups and campaigners understand what is available so they can "help government with the prioritization process for making that data accessible online" (Green, 2015). This parallels past and ongoing attempts to establish public data inventories and Information Asset Registers (Gray & Darbshire, 2011, p. 15-17). As well as arguing that data should be legally and technically open (accessible, machine readable and

license free) their recommendations include publishing “line-item” or transaction level information, safeguarding sensitive information, publishing in a timely manner from a central location that will remain persistently available, making data available in bulk, including metadata and unique identifiers, including information from quasi-governmental agencies, digitising historical material on public finances and publishing ancillary documents such as laws, procedures and timetables.

The Sunlight Foundation also point to the ongoing work of the United States Public Interest Research Group to evaluate state government transparency websites (U.S. PIRG, 2014, 2015). In the latest version of their report, the authors argue that public financial transparency websites should be “comprehensive, one-stop and one-click” - including “detailed information about government contracts, spending, subsidies and tax expenditures for all government entities” (p. 2). Specifically they argue that data should be bulk downloadable in formats suitable for data analysis such as XLSX, CSV, XML (p. 38). They also explicitly stipulate that information should include “checkbook-level” granular detail about transactions, as well as transactions from quasi-public agencies (p. 38).

The Open Government Guide topic section for “Budgets” includes publishing “budget reports as open data” as an intermediate commitment, stating that this entails making data available in “in machine-readable formats that can easily be retrieved, downloaded, indexed, and searched”, and preferably in formats for which the specification is publicly available (Transparency and Accountability Initiative, 2014). The authors argue that “in the longer term relevant budget data should be published directly from Financial Management Information Systems (FMIS) and comply with open data standards”. Several of the other commitments refer to making information more accessible to citizens (e.g. through the publication of a Citizens’ Budget) as well as making budgetary processes more open and participatory (e.g. through hearings, consultations, social audit mechanisms and participatory budgeting systems). As an advanced commitment, the guide suggests publishing data about “off budget” fiscal activities, specifically “timely, regular, comprehensive, accessible, and accurate information on financial activities that go beyond the routine items in a national budget including extra-budgetary funds, tax expenditures and quasi fiscal activities” (which, as per our definitions in the first section, would constitute open fiscal data).

It is also worth mentioning past and ongoing work around data standards and specifications for fiscal information - including between different sectoral transparency initiatives (Ashton, 2013), as well as for budget and spending data.¹¹ Data standards are particularly important in the context of integrating data from different sources, and to enable the comparability of fiscal information concerning different regions. David Heald suggests that aside from differences reflecting different social, cultural, administrative and classificatory approaches to the management of public finances, such comparability has been further complicated by widespread public sector reforms over the last three decades, and that “the positive state that has been displaced was much easier to comprehend, map and record than the successor regulatory state” (Heald, 2012, p. 41). Initiatives like the UN’s

¹¹ For further details about ongoing work on a “Budget Data Package” specification led by Open Knowledge, see: <https://github.com/openspending/budget-data-package/>

Classification of the Functions of Government (COFOG) standard and the IMF's 2001 Government Finance Statistics Manual (GFSM 2001) provide functional and economic classifications which have garnered significant traction amongst governments around the world. Projects like the World Bank's BOOST initiative and the International Aid Transparency Initiative (IATI) are helping to promulgate new norms for the publication of fiscal information.

While work on fiscal transparency data standards may be presumed to be merely a technical exercise, it is worth pointing out that decisions concerning how different categories of fiscal data are grouped, where classificatory boundaries lie, and what is prioritised, collected and included in different standards may have important longer term effects on which kinds of measures and indicators are foregrounded, which may in turn frame debates about fiscal policy at a more fundamental level. How fiscal data is structured determines its value in answering different kinds of questions, which can in turn shape democratic deliberation around fiscal policy. Hence it is crucial that discussions about standards and data production are grounded in an understanding of the contexts of use of fiscal data, both inside and outside the public sector.

Based on their work on how civil society organisations use budget data, Paolo De Renzio and Rebecca Simson derived a range of indicators which reflected some of the most common concerns of public interest advocacy groups (such as "actual versus budgeted expenditure on health" or "actual spending on primary education as a share of total expenditure"), and evaluated the extent to which these indicators could be derived from available fiscal data (De Renzio & Simson, 2013). We argue that further work needs to be done to better understand the kinds of indicators that civil society actors would be interested in deriving from fiscal data. Though apparently targeted at a fairly technically literate and specialist audience, the US Federal Government's consultation around elements of a new federal spending data standard gives one indication of what a more participatory process could look like.¹²

A summary of some of the main best practices in this section is summarised in the following table, along with an illustrative list of organisations and guidance documents which support them.

¹² See: <https://fedspendingtransparency.github.io/>

Best practice	Proposed by	Summary
Machine Readable	Open Definition; 8 Principles of Open Government Data; 5 Stars of Linked Open Data, Sunlight's Ten Principles for Opening Up Government Information; Min and Dener's World Bank Report; United States Public Interest Research Group; Open Government Guide.	Information should be published in a structured format suitable for data analysis, "machine processing" or "automated processing" (e.g. CSV, XLS).
Legally Open	Open Definition; 8 Principles of Open Government Data; 5 Stars of Linked Open Data, Sunlight's Ten Principles for Opening Up Government Information; Min and Dener's World Bank Report; Open Government Guide.	Information should be made available under an open license which permits reuse (as per the Open Definition), "license-free", or otherwise in a form which is free of legal restrictions on reuse.
Bulk Downloadable	Open Definition; Sunlight's Ten Principles for Opening Up Government Information; Min and Dener's World Bank Report.	All information in database can be downloaded at once.
Persistent	Sunlight's Ten Principles for Opening Up Government Information.	Sunlight suggest that "information made available online should remain online, with appropriate version-tracking and archiving over time".
Free of Cost	Sunlight's Ten Principles for Opening Up Government Information.	Information is available without charge.
Comprehensive	8 Principles of Open Government Data; Sunlight's Ten Principles for Opening Up Government Information; Min and Dener's World Bank Report; Open Government Guide.	All relevant information is published. Also described variously as "complete" and "extensive". Examples given include Open Budget Survey and IMF's Data Quality Assessment Framework for Government Finance Statistics. Information to be published also stipulated by U.S. PIRC.
Data Format is Open or Specification is Publicly Available	Open Definition; 8 Principles of Open Government Data; Sunlight's Ten Principles for Opening Up Government Information; Open Government Guide.	Also described in the 8 Principles of Open Government Data as "non-proprietary".
Timely	8 Principles of Open Government Data; Sunlight's Ten Principles for Opening Up Government Information; Min and Dener's World Bank Report; Open Government Guide.	Described by 8 Principles as "made available as quickly as necessary to preserve the value of the data".
Transaction Level Data Available	Open Knowledge; Sunlight Foundation; U.S. PIRC;	Also described as "checkbox level". The 8 Principles stipulate information should be made

		available with “highest possible level of granularity, not in aggregate or modified forms”.
Historical Data Available	Sunlight Foundation; Min and Dener's World Bank Report.	Continued availability of data and documents related to past budgeting cycles, and digitisation of those which are not yet available online.
Description of Financial Management Information System (FMIS) Available	Min and Dener's World Bank Report	Min and Dener argue that governments should disclose “adequate details about the functionality, operational status, technical architecture, scope, number of users, and other important aspects of the underlying information systems (FMIS, data warehouse [DW], or other)”.
Protection of sensitive information	Sunlight Foundation; Min and Dener's World Bank Report.	Sunlight argue that “financial information should be reviewed for any potentially sensitive items that need to be redacted before being published”. Min and Dener argue for adequate “data protection and information security policies”.
Associated Documents Available	Sunlight Foundation; Min and Dener's World Bank Report.	Sunlight argue that “laws, procedures, and timelines relating to financial data” should be “easily accessible online”.
Off Budget Fiscal Data Available	Sunlight Foundation; U.S. PIRC; Open Government Guide.	Including from “quasi-governmental agencies”
Compliant with Relevant Data Standards	Open Knowledge; IATI; COFOG; GFSM 2001.	Fiscal data should comply with relevant reporting, transparency and data standards - such as COFOG, GFSM 2001 or IATI.
Initiative to Make Information Accessible for Citizens	Min and Dener's World Bank Report; Open Government Guide.	For example, through citizens' budgets, data visualisations or translating budget codes into language comprehensible by non-specialists.

3. ACTORS

Who is associated with open budget data? There are many different reasons why answering this might be useful – from engaging or consulting with regional or thematic experts, to forging alliances, coalitions or working groups, to seeing how the issue is being put to work in the service of different goals and objectives.

In this section we map some of the actors who are associated with the issue of open budget data. This is based on an analysis of digital traces that we collected from different online spaces, including the web, social media and search engine results.

STARTING LIST OF ACTORS AROUND OPEN BUDGET DATA

To begin our digital mapping we generated an initial list of actors who are active around the issue of open budget data by triangulating several other lists derived from the web, social media and relevant publications.¹³ This initial list included the following organisations and initiatives:

Name	URL
International Budget Partnership (IBP)	http://internationalbudget.org/
Open Knowledge	http://okfn.org/
Global Initiative for Financial Transparency (GIFT)	http://fiscaltransparency.net/
World Bank	http://worldbank.org/
Open Government Guide	http://opengovguide.com/
Collaborative Africa Budget Reform Initiative (CABRI)	http://cabri-sbo.org/
freedominfo.org	http://freedominfo.org/
AidData	http://aiddata.org/
Overseas Development Institute (ODI)	http://odi.org/
OECD	http://oecd.org/
EU	http://ec.europa.eu/
ONE	http://one.org/
World Economic Forum	http://weforum.org/
Open Government Partnership - Civil Society Hub	http://ogphub.org/
Publish What You Fund	http://publishwhatyoufund.org/
Open Government Partnership	http://opengovpartnership.org/

¹³ Our list included organisations who were members of at least two of the following lists: expert organisations for the “Budgets” section of the Open Government Guide (Transparency and Accountability Initiative, 2014); organisations listed as key initiatives and partners of the World Bank’s Open Budgets Portal (part of the BOOST initiative to “facilitate access to budget data”); organisations included in the top 100 results for the search queries for “open budget data” and “open budgets” on 7th March 2015 using a research browser with depersonalised user profile and organisations who used the #openbudgets hashtag on Twitter, based on Twitter advanced search, January 2014 to January 2015. The full list is included in the appendix.

OpenGov Hub	http://opengovhub.org/
Open Spending	http://openspending.org/
Global Movement for Budget Transparency, Accountability, and Transparency (BTAP)	http://globalbtap.org/

HYPERLINK ANALYSIS OF ACTORS AROUND OPEN BUDGET DATA

We then did a hyperlink analysis using the IssueCrawler tool to understand how these actors are related and to understand the broader field in which they operate. Starting from our initial list of actors, the IssueCrawler collected links from their web pages. We used Gephi to analyse and visualise the relationships between the resulting list of actors (p. 20).

From this hyperlink analysis we were able to clearly distinguish distinct clusters of actors - including, for example, intergovernmental organisations (towards the right hand side), international development organisations (towards the lower right), global civil society organisations working on transparency and open data (towards the left and centre left), and access to information campaign organisations (towards the top left).

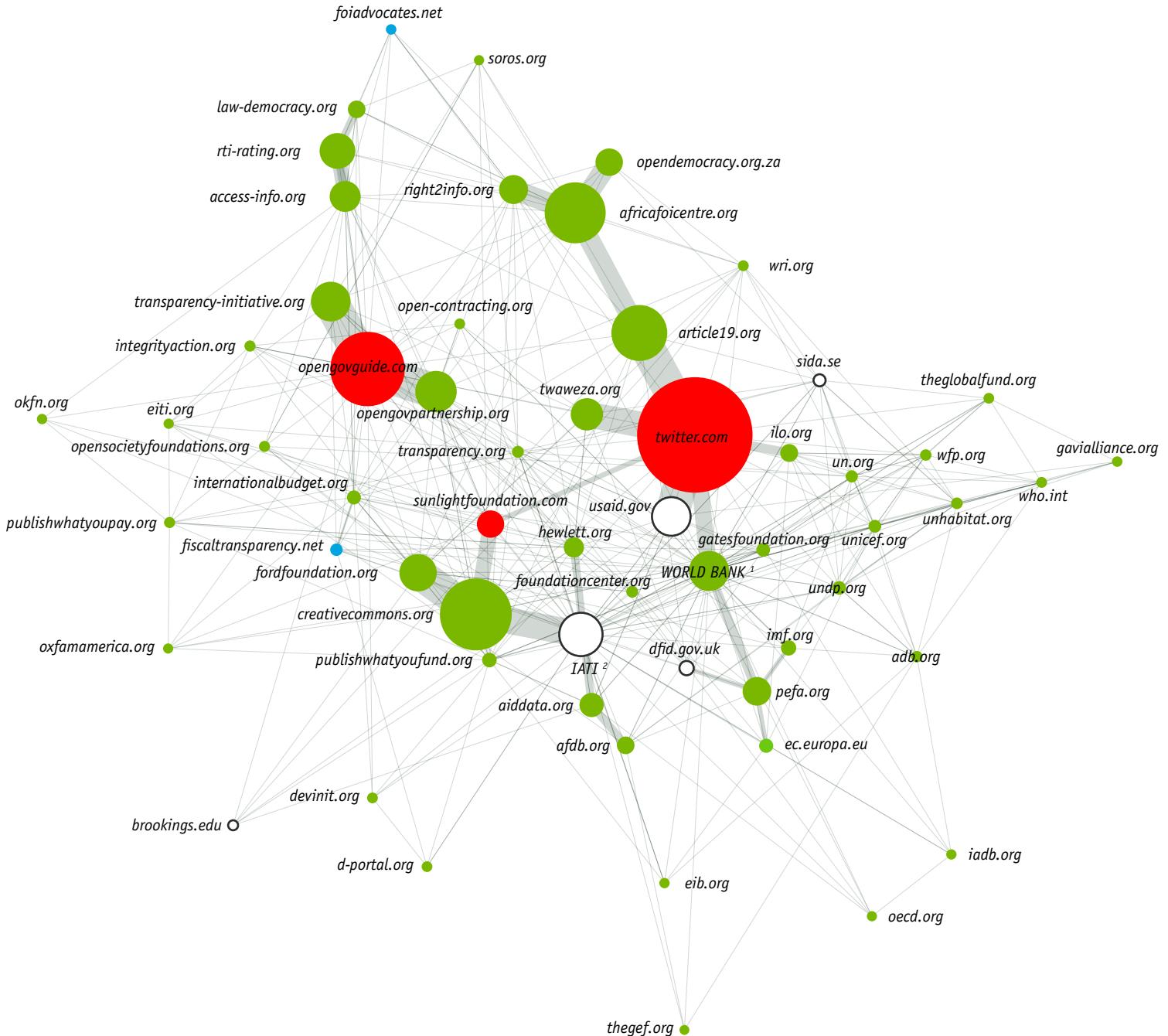
Overall, we noted that there is no central set of actors which mediates between all of these different clusters, indicating that the field may currently be comparatively diverse and decentralised. Instead there are actors which bridge different clusters – such as, for example, the World Bank (bridging between IGOs and national development agencies), the Transparency and Accountability Initiative and its Open Government Guide (bridging between access to information, financial transparency and open data groups), the Open Government Partnership (bridging between CSOs and IGOs), the International Aid Transparency Initiative (bridging between development agencies and transparency groups).

Funders appear to be distributed throughout the network, indicating their role, relationships and portfolios in different areas. For example, Open Society Foundations (OSF) is closer to access to information groups, and the William and Flora Hewlett Foundation is closer to international development organisations. National governments are represented by international development agencies (e.g. DFID, SIDA, USAID), but other departments are notably absent.

While the centre of the network is dominated by international and transnational actors who work on transparency and open government, towards the margins there are few regional and issue-based civil society organisations who do not have transparency as their main focus, such as Oxfam America (which appears in the network) and the Tax Justice Network Africa and CIVICUS (which were filtered out). The centrality of Twitter in the network indicated that this was a communication medium that was used by many of the actors in the network.

**OPEN BUDGET DATA
WEBSITES INTERLINK
ANALYSIS**

/ degree > 5; edge weight > 5



Hyperlink network based starting with organisations active around open budget data. 7th March 2015.

¹ ● WORLD BANK includes 13 nodes:

- worldbankgroup.org
- worldbank.org
- wbi.worldbank.org
- maps.worldbank.org
- go.worldbank.org
- econ.worldbank.org
- data.worldbank.org
- web.worldbank.org
- icsid.worldbank.org
- bancomundial.org
- miga.org
- ifc.org
- banquemondiale.org

² ○ IATI includes 3 nodes:

- aidtransparency.net
- iatiregistry.org
- iatistandard.org

ACTORS AROUND OPEN BUDGET DATA ON TWITTER

Given the prominence of Twitter in the hyperlink analysis, we decided to trace the networks of our initial list of organisations on this medium so that we could compare our findings (which is known as “cross-platform analysis” in new media studies). We used the Digital Methods Initiative’s Twitter Capturing and Analysis Toolset (DMI-TCAT) to extract lists of who our initial list of actors follow on Twitter, and then Gephi to produce the graph below (p. 22).

As with the hyperlink analysis this graph of Twitter followees shows distinct clusters of intergovernmental organisations (on the left), international development and development transparency organisations (towards the top), open data initiatives (towards the right and bottom right), and international transparency organisations (in the middle).

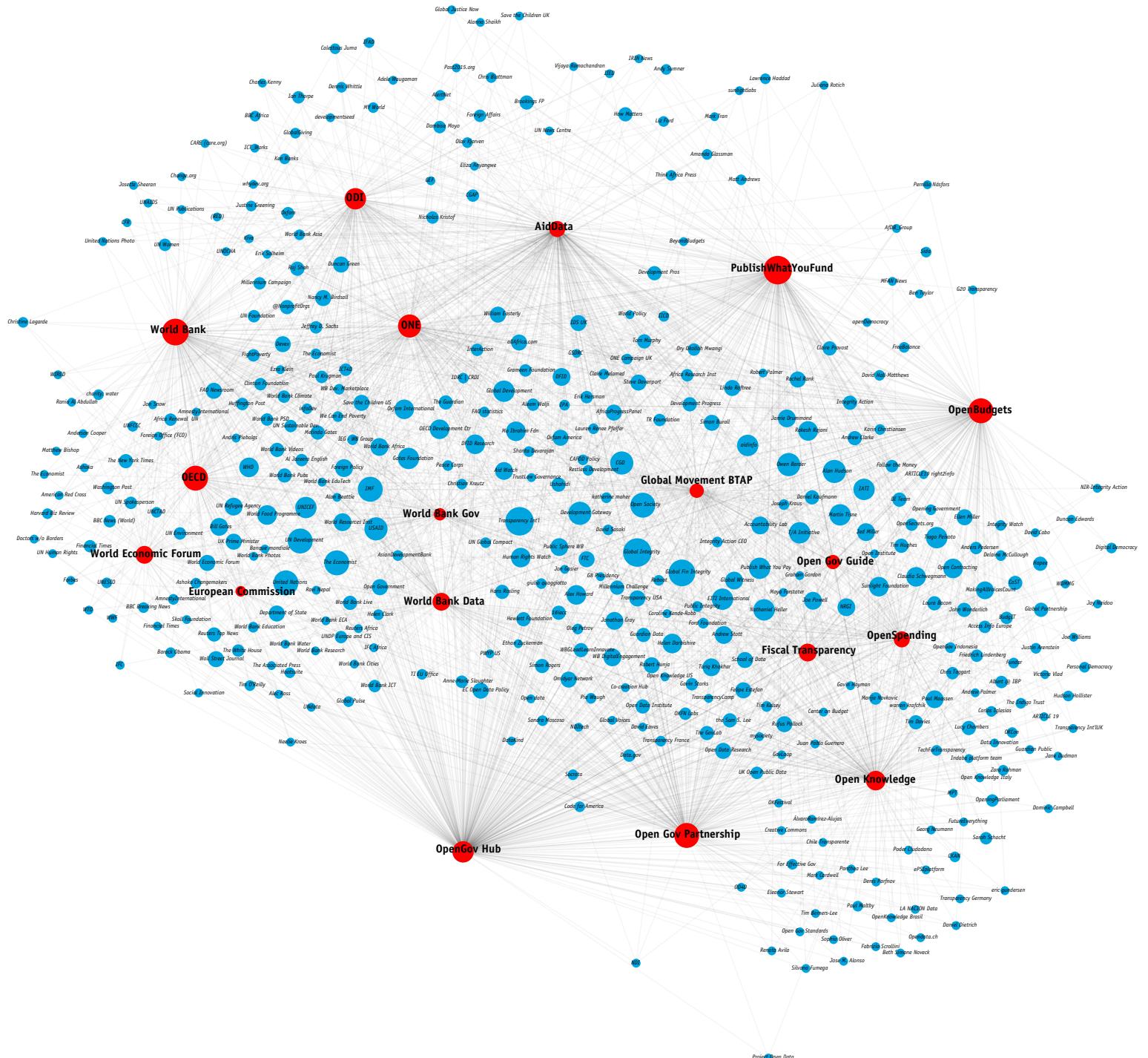
In this network there appears to be a greater diversity of civil society organisations who don’t have transparency or open government as their main focus, notably anti-poverty, development and humanitarian organisations such as Oxfam, CAFOD, Save the Children, Doctors Without Borders, and Global Justice Now. There is also a noticeable presence of international English language media outlets. A list of the accounts most followed by our initial list is also included below (p. 23).

**TOP BUDGET
ACTORS-FOLLOWEES
NETWORK**

/ 5 or more followers only

● top budget actors
● followees

size
=
degree



Network showing Twitter accounts followed by at least 5 of the organisations on our list of initial actors around open budget data. 18th March 2015.

**TOP BUDGET
ACTORS-FOLLOWEES**

- top budget actors
- followees

A A
size
=
indegree

/ ranked by indegree

PUBLISHWHATYOUFUND
WORLD BANK
OPENBUDGETS
OPEN GOV PARTNERSHIP
ONE
OPENGOV HUB
ODI
OPEN KNOWLEDGE
WORLD BANK DATA
FISCAL TRANSPARENCY
OPENSPENDING
AIDDATA
OPEN GOV GUIDE
GLOBAL MOVEMENT BTAP
WORLD BANK GOV

TRANSPARENCY INT'L
GLOBAL INTEGRITY
GLOBAL FIN INTEGRITY
IMF
OPEN SOCIETY
CGD
USAID
DEVELOPMENT GATEWAY
ALAN HUDSON
OWEN BARDER
GLOBAL DEVELOPMENT
GATES FOUNDATION
T/A INITIATIVE
IATI
EITI INTERNATIONAL
PUBLISH WHAT YOU PAY

MARTIN TISNE
NATHANIEL HELLER
AIDINFO
TIAGO PEIXOTO
OXFAM INTERNATIONAL
OPEN CONTRACTING
ALEX HOWARD
SUNLIGHT FOUNDATION
MO IBRAHIM FDN
HELEN DARBISHIRE
CLAUDIA SCHWEGMANN
RAKESH RAJANI
DFID
JOE POWELL
MAKINGALLVOICESCOUNT
PAUL MAASSEN
ACCOUNTABILITY LAB
WB DIGITALENGAGEMENT
JED MILLER
JONATHAN GRAY
JAMIE DRUMMOND
GLOBAL WITNESS
PUBLIC SPHERE WB
NRGI
OXFAM AMERICA
FTC
SCHOOL OF DATA
FELIPE ESTEFAN
ROBERT HUNJA
SAVE THE CHILDREN US
RACHEL RANK
OPEN GOVERNMENT
TRANSPARENCY USA
ELLEN MILLER
LINDA RAFTREE
RUFUS POLLOCK
STEVE DAVENPORT
DUNCAN GREEN
OMIDYAR NETWORK
IDS UK
WILLIAM EASTERLY
DEVELOPMENT PROGRESS
WB LEADLEARNINNOVATE
THE GOVLAB
GLOBAL PARTNERSHIP
INTEGRITY ACTION
HOW MATTERS
LAURA BACON
TIM HUGHES
DEVELOPMENT PROS
ANDREW CLARKE
CLAIREE PROVOST
DI TEAM
COST
MELINDA GATES
HAPEE
JOHN WONDERLICH
16IACC
LUCY CHAMBERS
SIMON ROGERS
DANIEL KAUFMANN
HEWLETT FOUNDATION
BROOKINGS FP
FRIEDRICH LINDBERG
FOLLOW THE MONEY
ORY OKOLLOH MWANGI
NICHOLAS KRISTOF
OPENINGPARLIAMENT
ALBERT @ IBP
ANDERS PEDERSEN
UNDP EUROPE AND CIS
ACCESS INFO EUROPE
AЛЕЕМ WALJI
MARIJA NOVKOVIC
ANNE-MARIE SLAUGHTER
AFRICA RESEARCH INST
BUDGIT
JEFFREY D. SACHS
CGAP
DAMBISA MOYO
OPENING GOVERNMENT
AMANDA GLASSMAN
REBOOT
FORD FOUNDATION
PERSONAL DEMOCRACY
MATT ANDREWS
OPENGOV INDONESIA
LIZ FORD
CKAN
TECHFORTRANSPARENCY
GIULIO QUAGGIOTTO
ASIANDEVELOPMENTBANK
INTEGRITY WATCH
DAVID HALL-MATTHEWS
KATHERINE MAHER
SIDA
TIM KELSEY
KARIN CHRISTIANSEN
CLAIRE MELAMED
DIGITAL DEMOCRACY
HELEN CLARK
OKCON
TRANSPARENCY FRANCE
INTEGRITY ACTION CEO
SHANTA DEVARAJAN
ANDY SUMNER
JUSTIN ARENSTEIN
TI EU OFFICE
THE INDIGO TRUST
ASHOKA CHANGEMAKERS
FREEBALANCE
DELALINE MCCULLOUGH
DAVID SASAKI
FUNDAR
IPA
LAWRENCE HADDAD
MFAN NEWS
OPENDEMOCRACY
IRIN NEWS
GOVLOOP
JAY NAIDOO
GUARDIAN PUBLIC
ARTICLE19 RIGHT2INFO
MPT
DAVID CABO
VICTORIA VLAD
DUNCAN EDWARDS
GSRC
INDABA PLATFORM TEAM
BEN TAYLOR
JUAN PABLO GUERRERO
BEYOND BUDGETS
ANDREW PALMER
JANE DUDMAN
ALAN BEATTIE
PODER CIUDADANO
JOE WILLIAMS
TRANSPARENCY INT'L
AFDB GROUP
DANIEL DIETRICH
CHILE TRANSPARENTE
TRANSPARENCY GERMANY
GRAHAM GORDON
JÁLVAR ORAMA REZ ALUJAS
MARK TRAN
ROBERT PALMER
WDMIG
ARTICLE 19
GEORG NEUMANN
NIR-INTEGRITY ACTION
EPSIPLATFROM
JULIANA ROTICH
PERNILLA NYSFORS
ERIC GUNDERSEN
WARREN KRAFTIK
G20 TRANSPARENCY
CENTER ON BUDGET

Tag list showing Twitter accounts followed by at least 5 of the organisations
on our list of initial actors around open budget data, ranked by number of followers

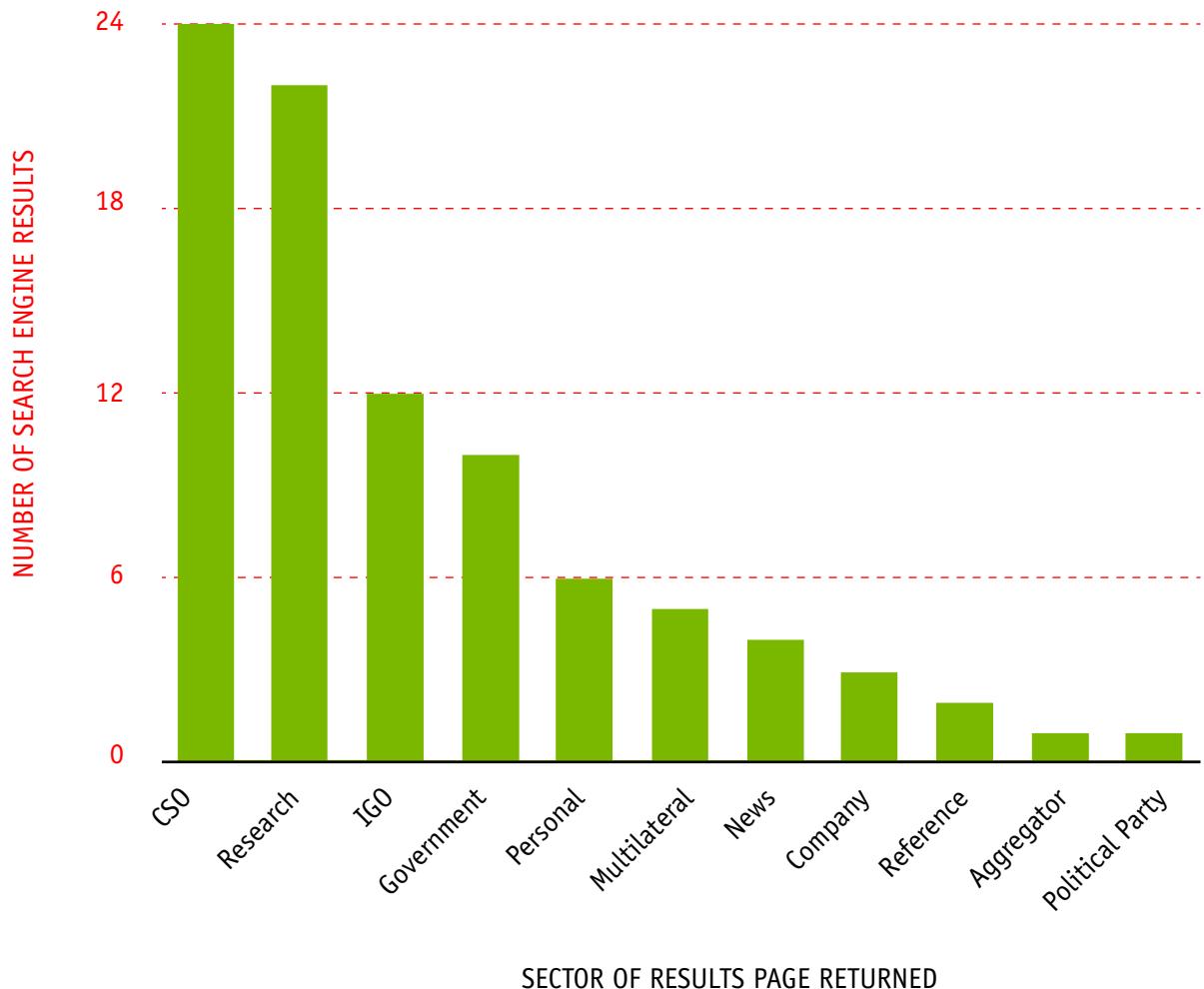
ACTORS AROUND OPEN BUDGET DATA IN SEARCH ENGINE RESULTS

To obtain another view we analysed a list of URLs returned by a search engine query for “open budget data” on Google.com using a research browser which gave us depersonalised results. A relatively small number of results were returned (145 in total, of which 90 explicitly mentioned open budget data) indicating that open budget data remains a niche issue. As well as giving us insight into the composition of issues and arguments around open budget data (as we shall look at in the next section), it also gave us a reading of the different sectors and countries of operations of actors who use the term, which are displayed in the following two graphs (pp. 25, 26).

Concurrent with our hyperlink analysis and analysis of Twitter data, international civil society organisations and intergovernmental organisations are the most prominent actors around open budget data in search engine results. It is notable that research organisations are significantly more prominent in search engine results than in our hyperlink analysis or on Twitter data. Also Germany was the third most common country for websites mentioning open budget data to be based, after organisations with international operations or those based in the US.¹⁴

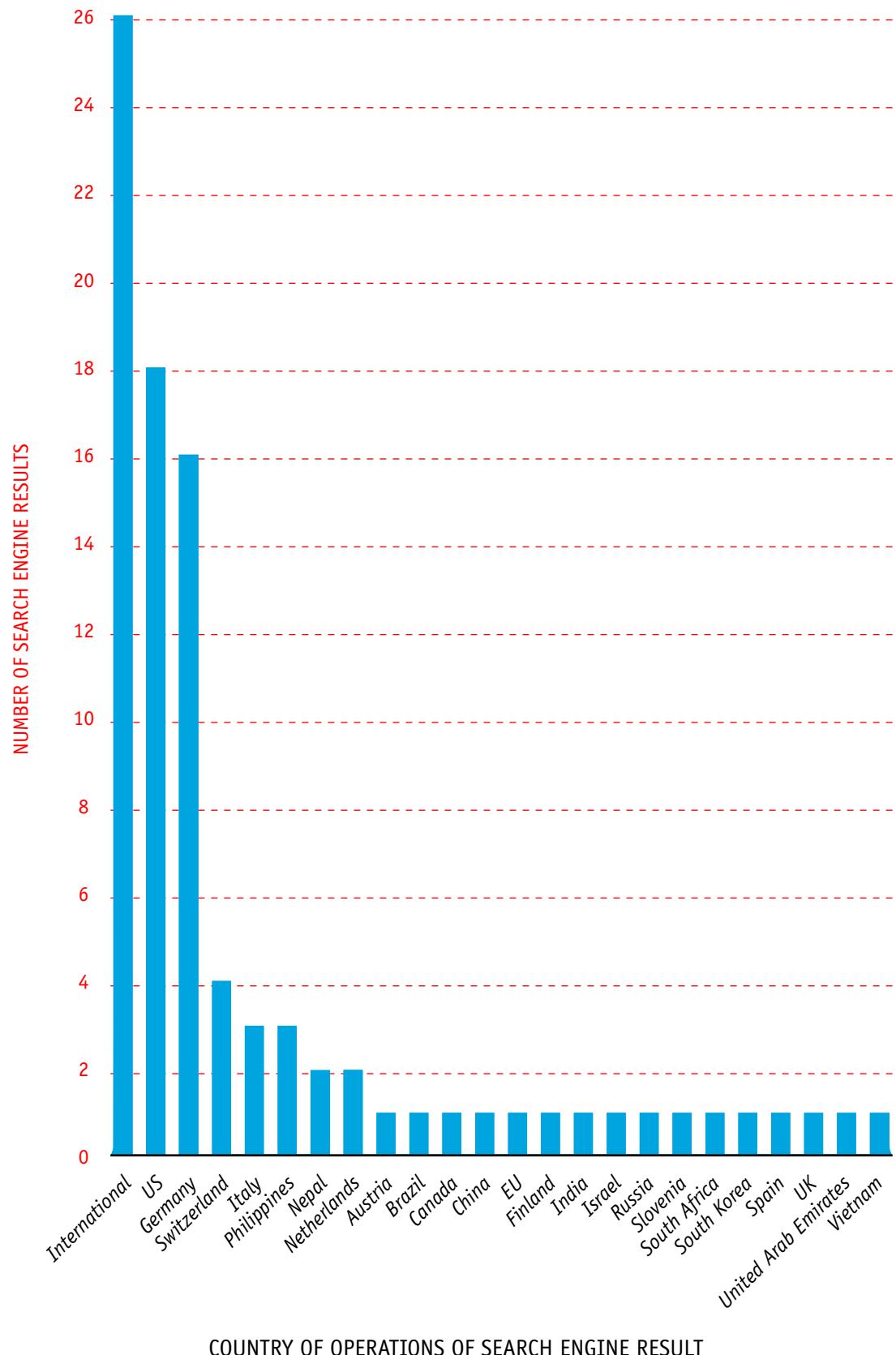
¹⁴ This appears to be partly due to the work of researchers such as Jörn von Lucke and his colleagues at Zeppelin University, who have published several studies on open budget data in Germany, as well as giving talks and interviews on this topic.

*OPEN BUDGET DATA
IN SEARCH ENGINE RESULTS
/ per Sector*



Search engine results for “open budget data” on Google.com, 7th March 2015. Coded by sector.

**OPEN BUDGET DATA
IN SEARCH ENGINE RESULTS
/ per Country**



Search engine results for “open budget data” on Google.com, 7th March 2015
Coded by country or region of operations.

KEY FINDINGS

In summary, from our mapping of who is active around the issue of open budget data on digital media we have found that the most prominent actors are intergovernmental organisations (notably the World Bank), multi-stakeholder initiatives (such as OGP and IATI), as well as international civil society organisations who mainly work around open government, government transparency, aid transparency, open data and related topics. Local and regional organisations, as well as civil society organisations who focus on topics other than transparency and open government, are comparatively marginal.

To what extent does this matter? Our mapping of actors has focused on who is using the term open budget data, rather than who is using budgetary data itself - and it may well be that a much broader and more diverse cross section of civil society actors are using data and referring to it in different terms. Perhaps open budget data can remain an issue mainly for international governmental and global open government CSOs, with a wider group of actors using open budget data without explicitly referring to it as such.

However perhaps there are advantages to the issue of open budget data securing a broader audience - whether with campaign groups who can push for more granular data at sub-national level, or with data journalists who can liaise more closely with transparency advocates to secure the release of budgetary data which is most valuable for their work in the context of public interest investigative reportage. What one considers the optimal audience for open budget data as an issue depends on the arguments for why it matters and the models for how it is supposed to bring about the desired results (often referred to as "theories of change" in the non-profit sector), as we shall look at in more detail in the following section. The crucial thing is that the engagement of actors around open budget data as a policy and advocacy issue is appropriate to and commensurate with the envisaged applications and desired outcomes.

4. ISSUES

Why does open budget data matter? How might it be put to work in the service of different projects, goals and objectives? To what extent does it represent a continuation of or a departure from concerns associated with financial transparency more generally?

As we have seen in our survey of definitions, open budget data mainly focuses on the manner in which information about public finance is legally and technically made available. While there is a relatively high degree of consensus about what it means for information to be published as open budget data, there are much more diverse set of arguments about why it is important.

Many of these reflect broader arguments about why financial transparency is important on the one hand, and arguments about why open data is important on the other. These arguments in turn reflect many different political agendas and approaches towards fiscal policy.

In this section we review arguments for open budget data and fiscal transparency in research and practitioner literature, and look at the extent to which these are present amongst different actors associated with open budget data in different digital spaces.

REVIEW OF ARGUMENTS IN EXISTING LITERATURE ON FINANCIAL TRANSPARENCY

Many transparency researchers argue that financial transparency is a malleable concept which can serve a wide range of different political views and policy proposals (Heald, 2012, p. 31; Philips & Stewart, 2008, p. 22). Different arguments about why financial transparency matters will lead to different priorities around what data is made available, how it is made available, for whom to use and to what end. David Heald argues that the “optimal configuration of transparency” will differ depending on what concern one is seeking to address, for example, “reducing corruption” or “increasing efficiency, effectiveness and legitimacy” (Heald, 2012, p. 31).

Many commentators argue that international norms and standards around financial transparency at intergovernmental level have their roots in efforts to promote “good governance” and “fiscal discipline” (Khagram, Fung, & de Renzio, 2012; Min & Dener, 2013; Philips & Stewart, 2008; Transparency and Accountability Initiative, 2014). In particular it is held that public financial management reforms were pursued to control expenditure, reduce budget deficits, and signal credibility to international markets to attract foreign investment (Min & Dener, 2013: 1; Granickas, 2013). In this context the intended direct users and beneficiaries of information released through financial transparency initiatives would often be governmental and intergovernmental actors, multilateral initiatives, development agencies, foreign investors and private sector actors (Kopits & Craig, 1998). Some have argued that this focus on fiscal discipline in global financial transparency norms and standards from the 1990s

meant that historically some intergovernmental actors have been "less aware of or concerned with distributive and other impacts on local populations" (Philips & Stewart, 2008, p. 54).

It is commonly held that fiscal transparency is an enabler for greater public participation and democratic accountability around public finances. However, it is also acknowledged that the causal dynamics between these three concepts is not always straightforward or predictable (Fox, 2007; Carothers & Brechenmacher, 2014; Petrie & Khagram, 2015). As De Renzio and Simson argue:

The relationship between transparency, citizen engagement and accountability is not simple or linear. Improvements in the availability of government information do not necessarily result in greater public participation in policy processes; even when they do, this will not automatically lead to governments becoming more accountable to their citizens. (De Renzio & Simson, 2013: 1)

David Heald argues that "the production and distribution of information per se is insufficient" as "transparency requires an audience with the capacity to understand and act" (Heald, 2012, p. 39). Hence in the following paragraphs we will survey some of the different mechanisms through which the greater availability and openness of budgetary information is argued to lead to better outcomes for citizens.

Many researchers and practitioners argue that open budgets can improve the quality of democratic engagement and deliberation around fiscal policy by enabling greater citizen awareness of public finances and more informed debate (Gomez, Friedman & Shapiro, 2005; Philips & Stewart, 2008; De Renzio & Simson, 2013: 1; Craveiro & Martano, 2015). Citizens' budgets are intended to make resource allocations more accessible to broader audiences (International Budget Partnership, 2012a). In the context of open budget data it is often argued that data visualisations may help to improve public understanding of public finance (Walker, 2010; Min & Dener, 2013: xxiii). Greater openness is also widely argued to increase trust in government (Min & Dener, 2013: 1).

As well as initiatives intended to promote greater understanding and awareness of public finances, there are also various forms of more active budgetary monitoring projects to help ensure that allocated resources deliver the results that they are supposed to. For example, projects have been undertaken to use social audits, citizen report cards and procurement tracking to provide oversight of financial flows. Some civil society organisations have experimented with more formal mechanisms like Public Expenditure Tracking Surveys (PETS), originally developed and used by IGOs, to identify potential corruption, misuse or leakages of public funds (USAID, 2014; International Budget Partnership, Development Finance International, & Oxfam America, 2014). It is argued that open data brings new opportunities for citizen budget monitoring, including through geocoding projects and topic specific tracking initiatives (Fioretti, 2010). There have also been suggestions that releasing granular information about public expenditure can enable citizens to help identify waste. The UK government suggested that "armchair auditors" could help to facilitate cost savings (Worthy, 2013), and von Lucke et al give several examples of citizen "austerity budget" projects in Germany (Heald, 2012; von Lucke, Geiger, Hoose, & Schreiner, 2011).

Some argue that financial transparency enables greater citizen participation in the budgeting process (Gomez, Friedman & Shapiro, 2005; Philips & Stewart, 2008). Several reports explicitly mention the potential role of open data in participatory budgeting initiatives where citizens have more direct control in how public funds are allocated (von Lucke, Geiger, Hoose, & Schreiner, 2011; Sillanpää, 2013). Von Lucke et al also mention the opportunities created by digital technologies for new forms of participation, deliberation, commenting and discussion around public finance, which they term “Open Budget 2.0” (von Lucke, Geiger, Hoose, & Schreiner, 2011). While there have been a spate of experiments to increase participation around budgeting, as an aside it is worth noting that many countries included in IBP’s Open Budget Survey received low scores for public participation indicating that there is room for progress in this area (International Budget Partnership, 2012b).

As well as information about public money being used to improve public understanding of and participation in fiscal policy, it is argued that civil society organisations can use data to improve their analysis, advocacy and policy proposals which may result in better outcomes for citizens. For example, Oxfam and Development Finance International collaborated on a report looking at whether spending on the Millennium Development Goals was adequate to meet targets (Development Finance International & Oxfam, 2013). As well as directly using fiscal data for public interest advocacy, civil society organisations and media organisations may also play an important role as intermediaries or ‘information brokers’ (Heald, 2012, p. 40).

It is widely argued that financial transparency can lead to better and fairer resource allocations for citizens (International Budget Partnership, Development Finance International, & Oxfam America, 2014). For example, poverty-reducing or “pro-poor” budgeting initiatives use financial transparency as an instrument to advance fiscal policies that distribute public funds in favour of disadvantaged groups (see, for example, Bräutigam, 2004; De Renzo, 2005; United Nations, 2005; Robinson, 2008; Philips & Stewart, 2008; Simson, 2012). This includes advocating for increased spending in certain areas, for earmarking a percentage of revenues (e.g. from natural resource) for social spending programmes, as well as arguing for more progressive taxation and tax distribution policies.

MAPPING ISSUES AND ARGUMENTS FOR OPEN BUDGET DATA IN DIGITAL MEDIA

In this section, we examine the extent to which these different issues and arguments about financial transparency are present where open budget data appears on the web and on social media (in particular on Twitter, which we established was a major channel for many of the top actors around open budget data, as discussed in the previous section).

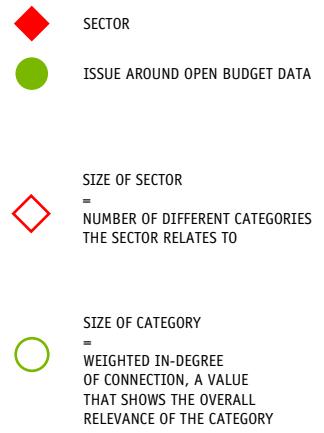
ISSUES AROUND OPEN BUDGET DATA ON THE WEB

As search engine results appeared to be one of the richer sources of evidence about open budget data online, we used open coding to characterise these mentions and to establish which kinds of issues were most and least prominent on the web. As mentioned above, there were 145 results in total obtained through search engine results on Google.com using a research browser with depersonalised settings, of which 90 explicitly mentioned open budget data. We identified 63 different commonly mentioned topics and issues, and also coded each result by sector and country of operations.

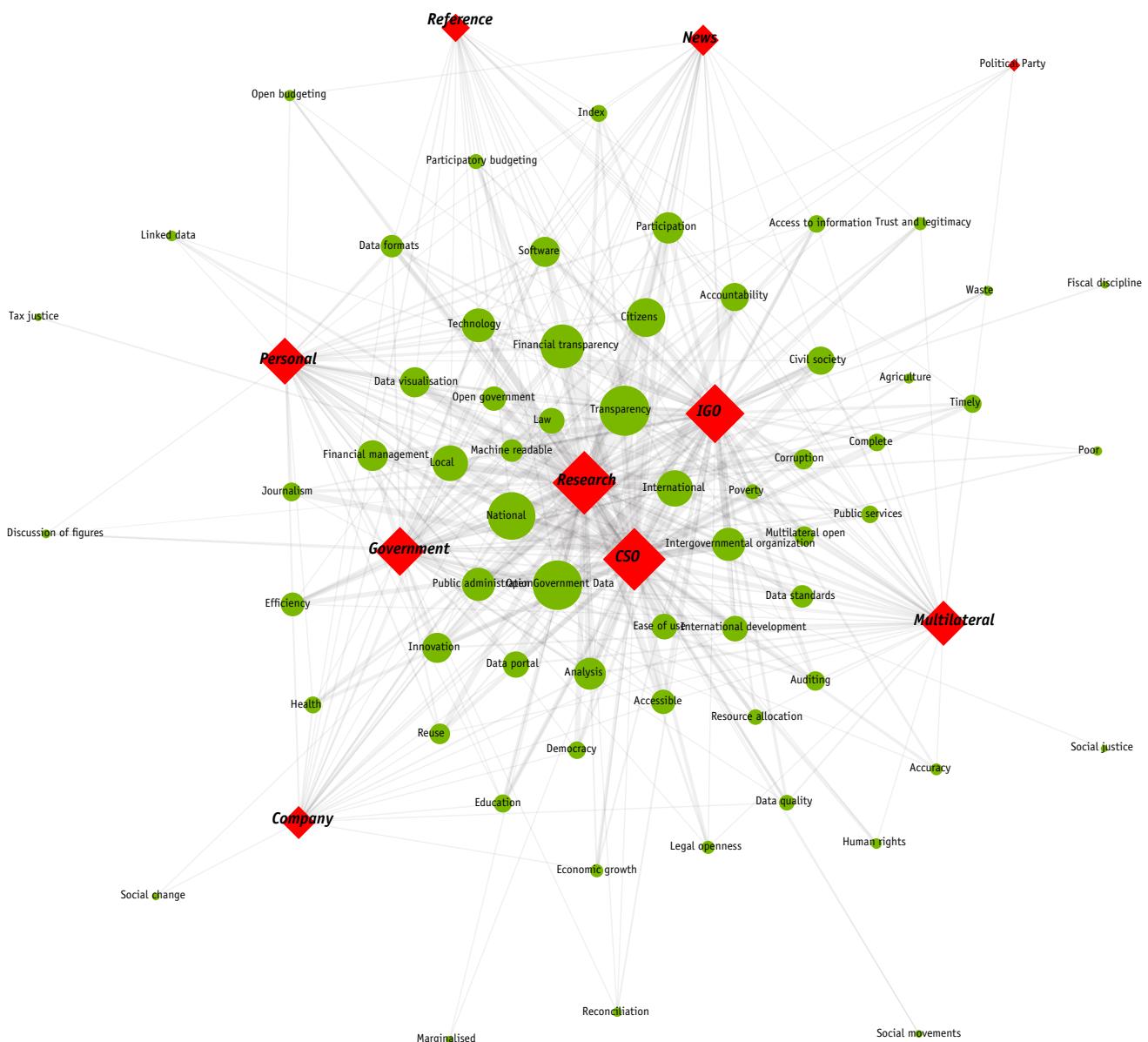
While over half the results (57.8%) explicitly mentioned citizens as users or beneficiaries of open budget data, and topics such as participation (44.4%), accountability (38.9%) and civil society (38.9%) were also comparatively frequently mentioned, many of the topics associated with more than a quarter of the results focused on more technical topics - including explicit discussion of technology (48.9%), software (42.2%), data visualisation (42.2%), data portals (35.6%), machine readability (28.9%) and data formats (28.9%). Issues related to more specific societal and political arguments, impacts and outcomes of open budget data were mentioned in less than a quarter of the results - such as corruption (24.4%), journalism (22.2%), democracy (20.0%), access to information (20.0%), public services (20.0%), health (18.9%), resource allocation (16.7%), participatory budgeting (15.6%), poverty (15.6%), trust and legitimacy (12.2%), human rights (7.8%), agriculture (6.7%), the poor (5.6%), tax justice (2.2%), and social justice (1.1%).

To get a sense of whether these different issues and topics around open budget data clustered by sector or by country we used Gephi to analyse their relationships using network graphs, as displayed below. In the network graph showing relationships between different issues and sectors (p. 32), we observed a more technical cluster including topics such as technology, data formats, machine readability, situated between IGOs, governments and researchers. Another cluster around accessibility, ease of use and analysis was more closely associated with CSOs. Topics such as public administration, financial management and efficiency were most closely associated with governments. Around the margins of the graph we could see topics such as social movements, social justice and human rights associated with CSOs and multilaterals, with fiscal discipline only mentioned by IGOs and tax justice only mentioned by researchers.

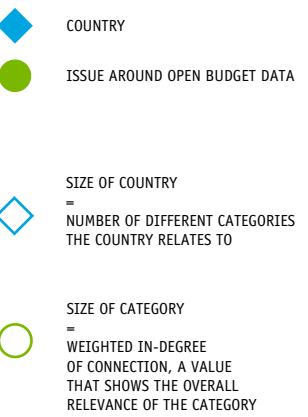
**NETWORK OF TOPICS AND SECTORS
ASSOCIATED WITH OPEN BUDGET DATA
IN SEARCH ENGINE RESULTS**



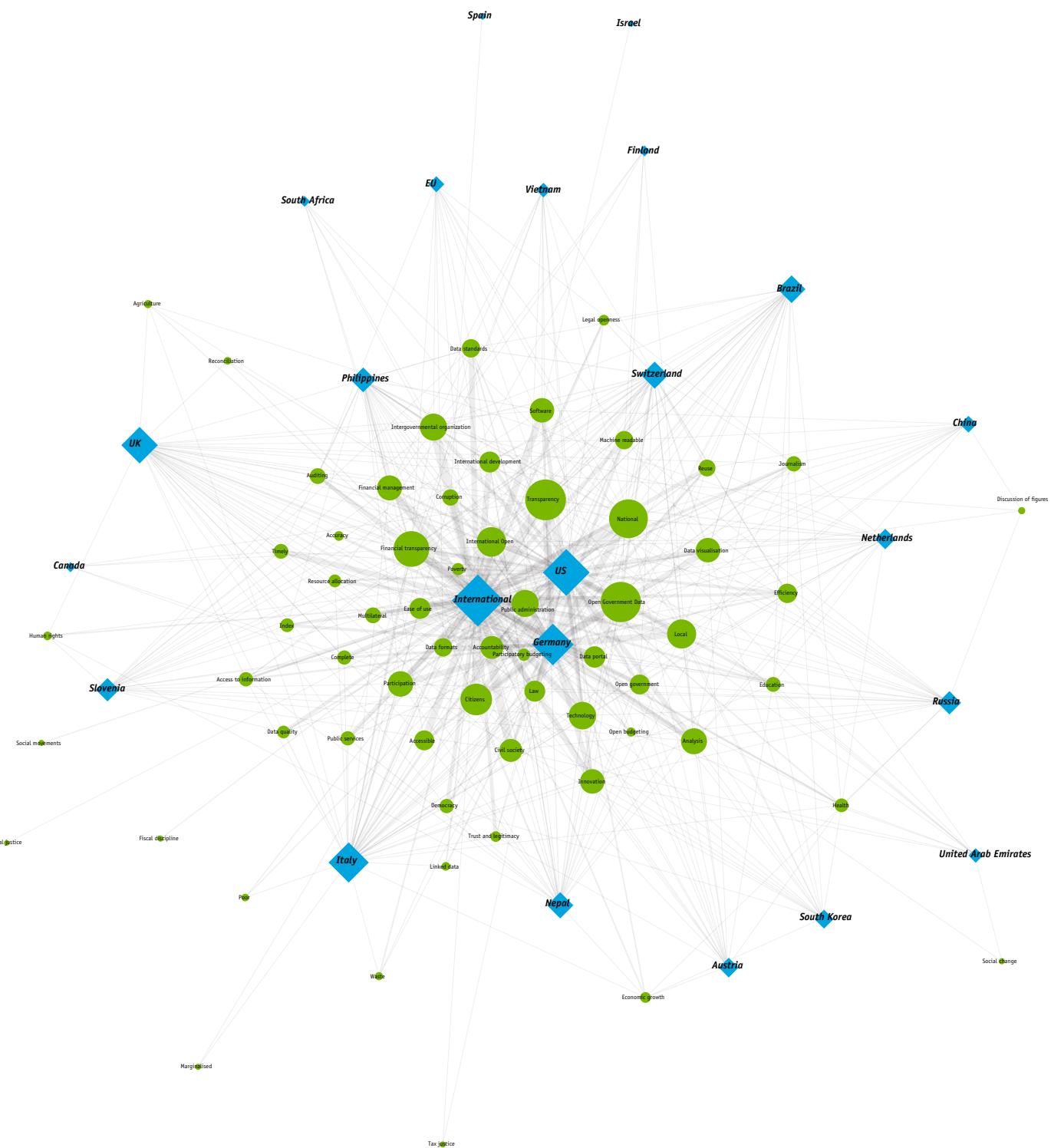
/
 Which issues are associated
 with open budget data
 in different sectors?
 Can we profile sectors according
 to their concerns around
 open budget data?



NETWORK OF TOPICS AND COUNTRIES ASSOCIATED WITH OPEN BUDGET DATA IN SEARCH ENGINE RESULTS



/
 Which issues are associated with open budget data in different countries?
 Can we profile countries according to their concerns around open budget data?



In the graph showing relationships between different issues and countries (p. 33) we can see the prevalence of results from the US, Germany and international organisations. As mentioned above, in Germany most of the mentions relate to research at Zeppelin University. In the US there are a number of official city initiatives around open budget data - including in Berkeley, Palo Alto, Sacramento and Washington DC. Around the periphery we can see a plethora of different concerns reflected in web pages from countries around the world - such as in Vietnam, where open budget data appears as an issue in relation to software systems for modernising public finance; in Israel, as part of a GitHub account for an open source software project to visualise the national budget; in Brazil, in relation to a research report on a tool for citizen engagement around local spending; in China, in the context of a blog post giving a behind the scenes look at a data journalism project on the Hong Kong budget; in Russia, in relation to the transaction-level analysis of public finances in Russian cities; in South Korea in relation to a project to contextually embed budget information alongside news articles on public money; and in the Philippines in relation to the government's public financial management reform programme.

ISSUES AROUND OPEN BUDGET DATA ON TWITTER

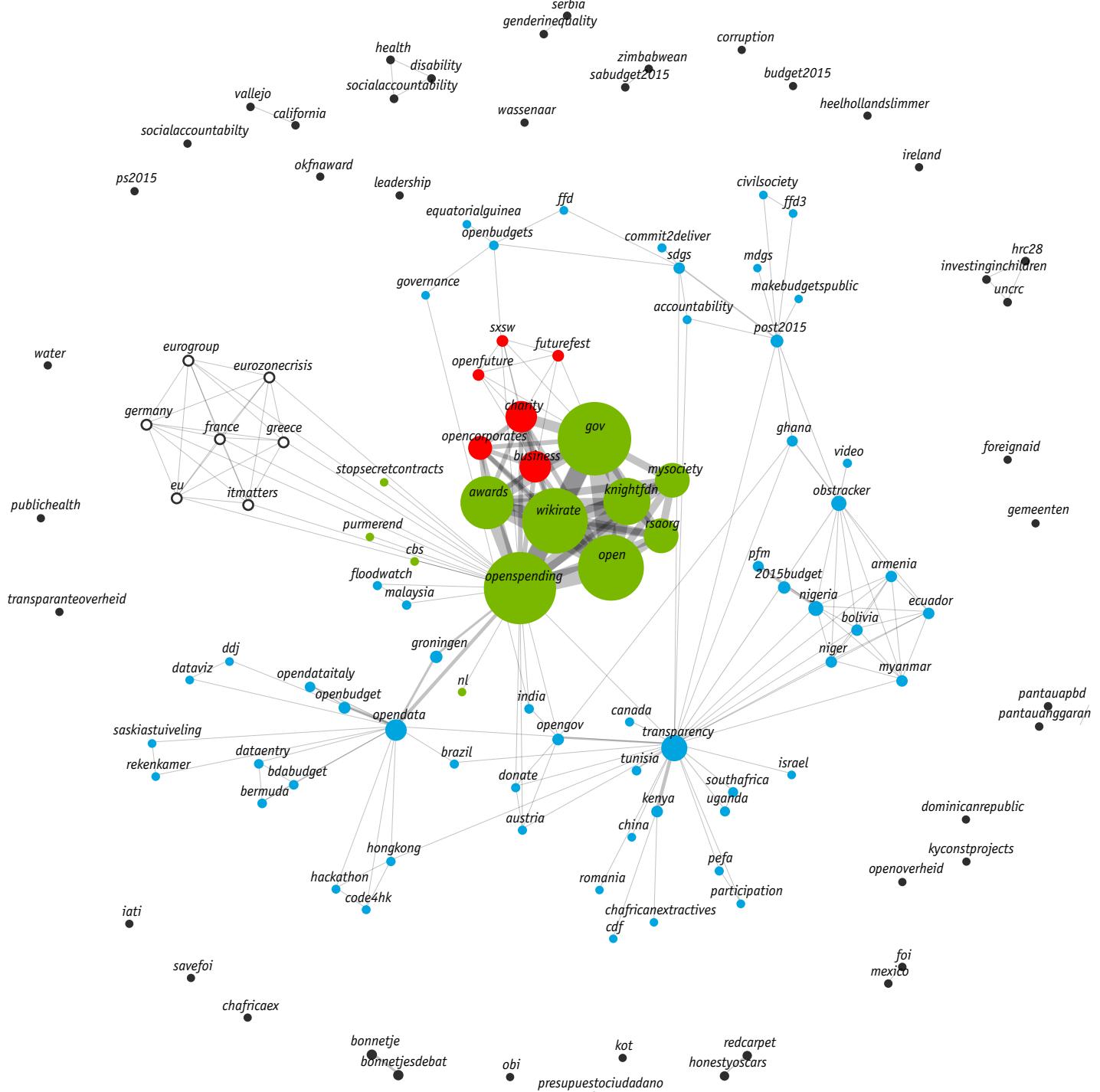
To obtain a complementary view we analysed tweets about open budget data and closely associated topics (including open budgets, open spending data, open fiscal data and open contracting data) collected from Twitter over a 30 day period using the Digital Methods Initiative's Twitter Capture and Analysis Tool (DMI-TCAT).¹⁵ We then exported data for network analysis using Gephi. We first performed a co-hashtag analysis to get a sense of the character of mentions of open budget data on Twitter, resulting in the following graph (p. 35).

In the centre of the graph are a series of hashtags tweeted in what looked to be an automated fashion by a very active personal account - including around government and spending. At the top there are several clusters around topics such as governance, open budgets, accountability, civil society, and the post-2015 sustainable development agenda (after the Millennium Development Goals). Towards the bottom left there are a cluster of data related topics, including open data, data journalism, data visualisation, hackathons and civic hacking initiatives. Across the graph there are numerous national and regional clusters - including a Eurozone cluster with France, Germany and Greece; and a transparency cluster including Canada, Tunisia, Kenya, China, Romania, Uganda, South Africa and Israel. At the periphery, are topics that are less frequently mentioned in relation to other topics - such as public health, water, disability, and a Chatham House event about extractive industries in Africa.

¹⁵ Full details available in the appendix.

**CO-HASHTAG
NETWORK**
/by modularity class

cluster 1 cluster 3
 cluster 2 cluster 4



Network graph showing relationships between top hashtags mentioned in relation to the issue of open budget data on Twitter, from 19th February to 20th March 2015.

A user-hashtag network graph of this collection (p. 37) showed significant clusters of users tweeting about open data and open spending. Prominent regional clusters included one group of users tweeting about topics like the 2015 budget and public financial management in Nigeria, and another about public health, extractives and aid transparency in Kenya. Topics like open budgeting were towards the centre of the network, including the Centre for Budget Monitoring and Citizen Participation in the Netherlands, which uses open data for public participation.

KEY FINDINGS

Our analyses on the web and social media indicated there are a broad and diverse range of issues associated with open budget data - broadly reflecting the range of different arguments for financial transparency. The most prominent issues on the web are technical in nature - related to reusability of fiscal information and the manner in which data is published. Many of the arguments specifically about open budget data (as opposed to financial transparency more generally) focus on the removal barriers to the reuse of fiscal information in order to enable many different types of downstream applications and usages - from budget data visualisations to more granular, localised or otherwise customised budget monitoring initiatives.

Some arguments point to specific innovations such as geocoding more granular data on maps in order to identify systematic underinvestment in poor regions, helping to identify cases of "ghost workers", or decreasing overlap between different aid donors (InterAction, 2014; Chapman, 2014; Appel, 2015). Some point to specific problems that open budget data can help to address, such as avoiding the painstaking and laborious task of piecing together "thousands of unstructured pages and PDF documents in all EU languages" through the provision of standardised, machine-readable information about public finance (Patz, 2011).

Other arguments are much more general and open-ended pointing to serendipitous reuse and new, hitherto unexplored forms of participation, engagement and collaboration enabled by digital technologies (as von Lucke et al argue for with their "Open Budget 2.0" concept). In this vein, an official spokesperson for the city of New York contended that "the most exciting thing" about opening up the city's budget data is "what the world does with it with their collective intellect" (Wood, 2013). Some have argued that this more general sense of excitement about the potential for new technological innovations has precipitated "changes in mindset around what transparency means and why it matters", and may also act as an incentive for governments to open up datasets for reuse (InterAction, 2014).

However, while a broad range of potential benefits were associated with the issue we were unable to find more detailed arguments or empirical research in existing literature or on digital media about how open budget data (as opposed to financial transparency more generally) can lead to better outcomes for citizens, whether in the form of increased participation or accountability, better allocations, or better advocacy, suggesting that further work may be needed in this area as it begins to grow and mature.

USER-HASHTAG NETWORK

● HASHTAG

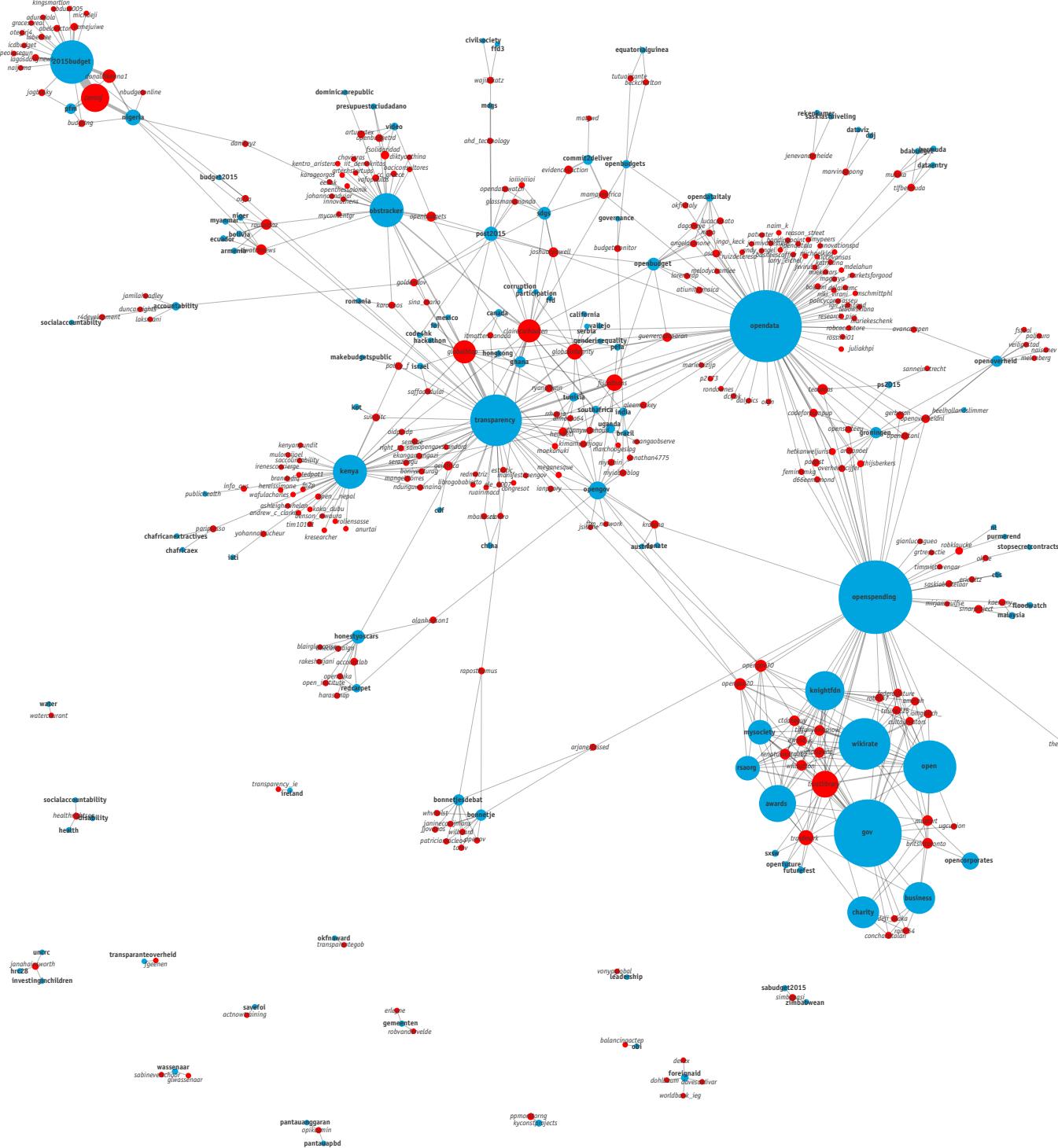
● USER

○ SIZE

=

NUMBER OF TWEETS (USERS)

AND MENTIONS (HASHTAGS)



Userhashtag network for the issue of open budget data on Twitter, from 19th February to 20th March 2015.

5. INITIATIVES

How is open budget data being used and put to work in society? While there are numerous studies focusing on the “supply side” of financial transparency - i.e. the conditions and dynamics of the disclosure of information about public finances - it is widely acknowledged that comparatively less attention has been paid to the “demand side”, namely how this information is being used, to what end, and the impacts of these usages (Khagram, Fung, & de Renzio, 2012; De Renzio & Simson, 2013: 1).

In this section we offer a brief overview of some of the different types of uses and impacts based on an analysis of 120 initiatives that were mentioned in relation to open budget data that we derived through our mapping work. More than half (50.8%) of the examples were from governments, 37.5% were from civil society organisations, and the remainder were from a mix of media organisations (5%), intergovernmental organisations (2.5%), companies (2.5%), multilaterals (0.8%) and research organisations (0.8%). The top five countries of origin of these examples were the US (29.2%), the UK (8.3%), Germany (7.5%), Russia (7.5%) and Switzerland (6.7%), with around a tenth (11.7%) from international organisations. A full list of these projects is included in the appendix. For the purposes of this study, we restricted ourselves to the sample of projects derived from our mapping work. Further examples are profiled in previous research projects from Open Knowledge (Chambers, Dimitrova, & Pollock, 2012; Pedersen & Chambers, 2014).

Country	Number	Percentage
US	35	29.2%
International	14	11.7%
UK	10	8.3%
Germany	9	7.5%
Russia	9	7.5%
Switzerland	8	6.7%
EU	5	4.2%
Brazil	4	3.3%
China	2	1.7%
Jordan	2	1.7%
Nigeria	2	1.7%
Norway	2	1.7%

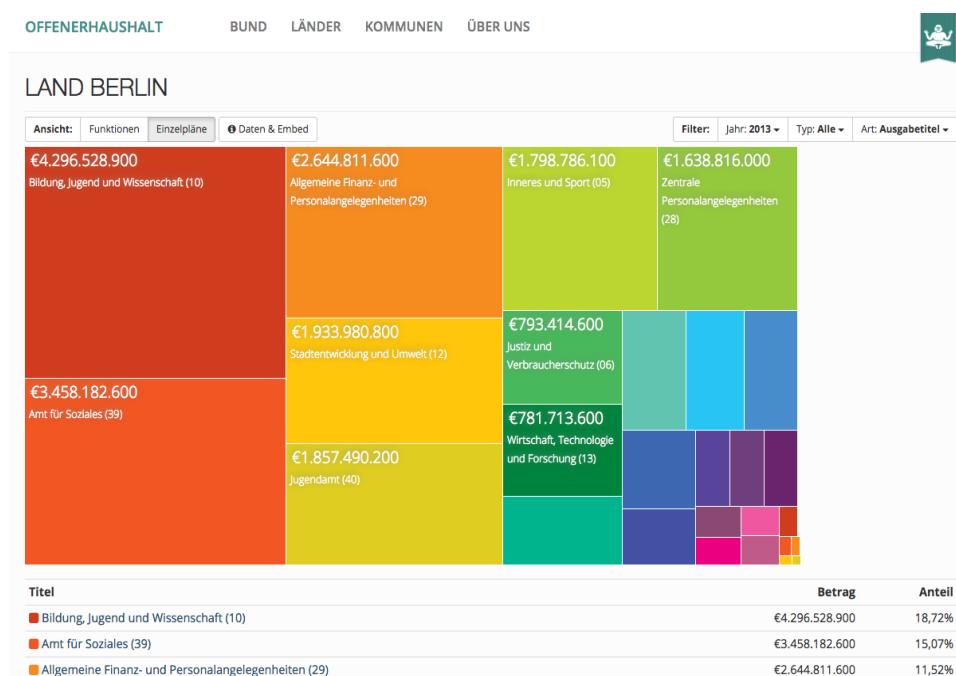
Sector	Number	Percentage
Government	61	50.8%
Civil Society	44	37.5%
Media	6	5.0%
IGO	3	2.5%
Company	3	2.5%
Multilateral	1	0.8%
Research	1	0.8%

Tables showing the sectors and 12 most frequent countries of a sample of 120 initiatives associated with open budget data.

DATA VISUALISATIONS TO INCREASE PUBLIC UNDERSTANDING OF PUBLIC FINANCES

One of the most common applications of open budget data was to create data visualisations. At least 65% of the projects that we examined used some form of data visualisation or interactive graphics to present information about public finances. Amongst the most commonly referenced examples were Open Knowledge's open source Open Spending and *Where Does My Money Go?* projects, as well as their various local versions and associated projects in over 70 countries (Chambers & Gray, 2012).¹⁶ There were also numerous city level initiatives including budget sites for a number of Swiss cities from OpenData.ch (the Swiss chapter of Open Knowledge) and a range of budget data portals for US cities deployed by companies such as OpenGov and Socrata.¹⁷

What are these different data visualisations for? What are their different functions? How do they guide and organise users' attention and shape their interactions with fiscal information? Many of these fiscal data visualisation projects give a top level overview of expenditure and revenue in the form of tree maps, bubbles or other visual forms, presenting different categories of public money from large to small, as well as enabling users to navigate down through hierarchies of categories to transaction level fiscal data.

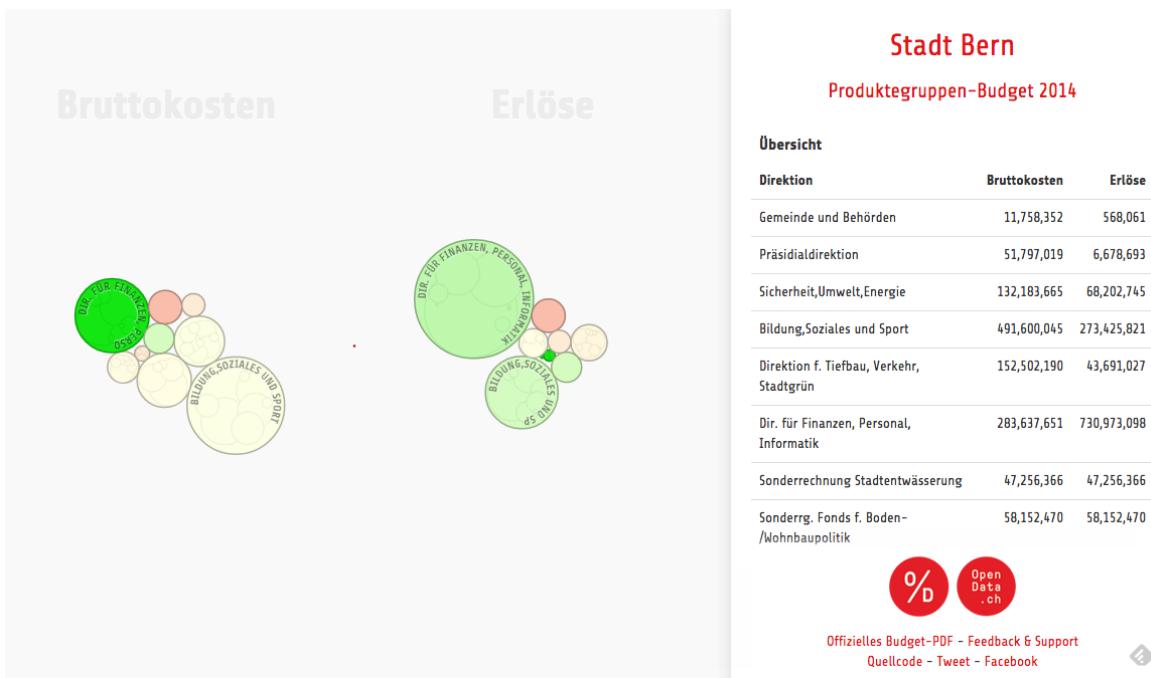


Tree map visualisation showing public expenditure in Berlin from Offener Haushalt project.¹⁸

¹⁶ See: <http://openspending.org>, <http://wheredoesmymoneygo.org/> and <http://offenerhaushalt.de/>

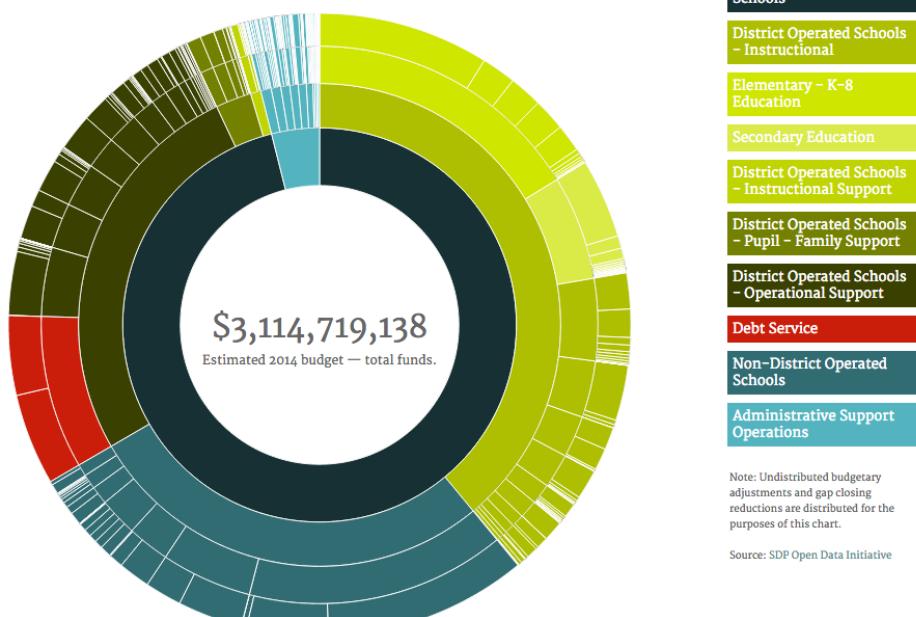
¹⁷ See: http://make.opendata.ch/wiki/project:open_budget, <http://www.socrata.com/> and <http://opengov.com/>

¹⁸ See: <http://offenerhaushalt.de/>



Bubble visualisation for City of Bern by OpenData.ch.¹⁹

Estimated 2014 budget: Total Operating Grant Capital Other
 Proposed 2015 budget: Total Operating Grant Capital Other



Visualisation of School District of Philadelphia Budget by Code for Philly.²⁰

¹⁹ See: <http://be.budget.opendata.ch/>

²⁰ See: <http://schoolbudget.phl.io/>

Others highlight spending trends over time. For example, the Open Aid website of the Swedish International Development Cooperation Agency (SIDA) says that it aims to help citizens “follow when, to whom and for what purposes aid funds have been disbursed, and with what results”.²¹ The site enables users to explore international development spending over time by department, recipient country, intermediary organisation and sector. It also gives descriptions of different activities, contextual information about countries, links through to associated strategy documents, and lets users download relevant datasets.

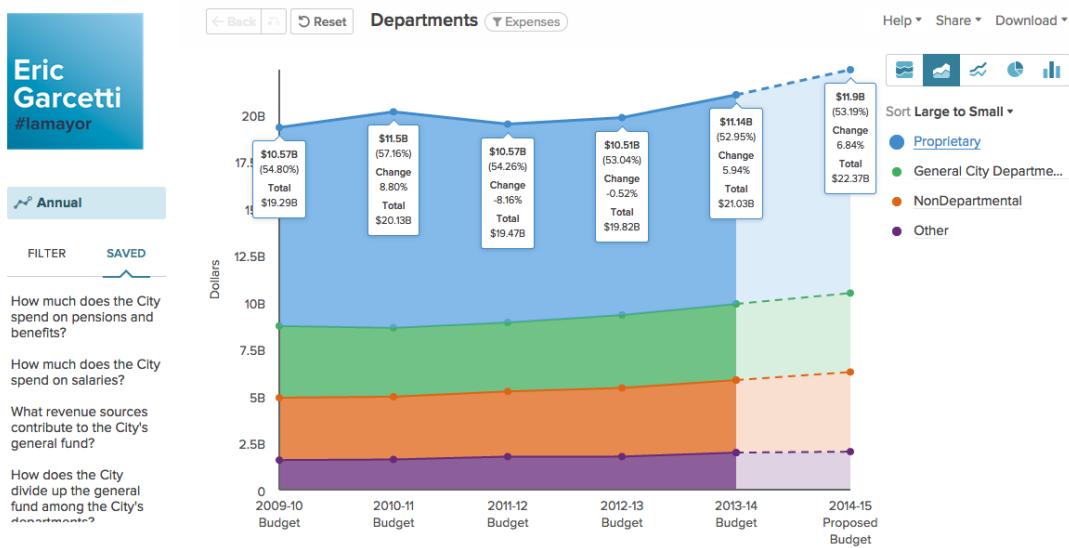


Time-series data visualisation from the Swedish Government's Open Aid project.

The LA Mayor's website, which is powered by OpenGov, is another example of a project which highlights spending over time, presenting users with visualisations with titles such as “how much does the City spend on pensions and benefits” and “what revenue sources contribute to the City’s general fund”.²²

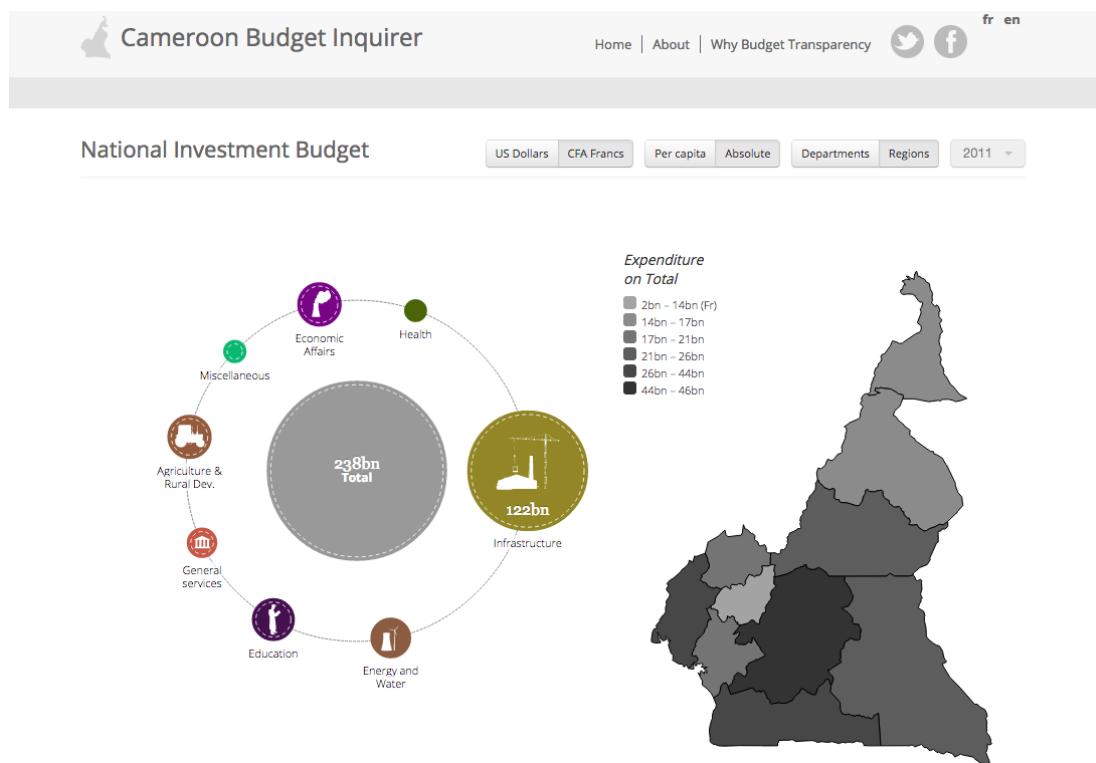
²¹ See: <http://www.openaid.se/>

²² See: <https://losangeles.opengov.com/transparency>



Time-series data visualisations from LA

Other visualisation projects give a geographical overview of project level expenditure, such as the Cameroon Budget Inquirer powered by the Open Spending software, or the City of Boston's Open Budget website, powered by Socrata.²³ Some, such as the US Government's USASpending.gov, generate charts showing top contractors and recipients.²⁴



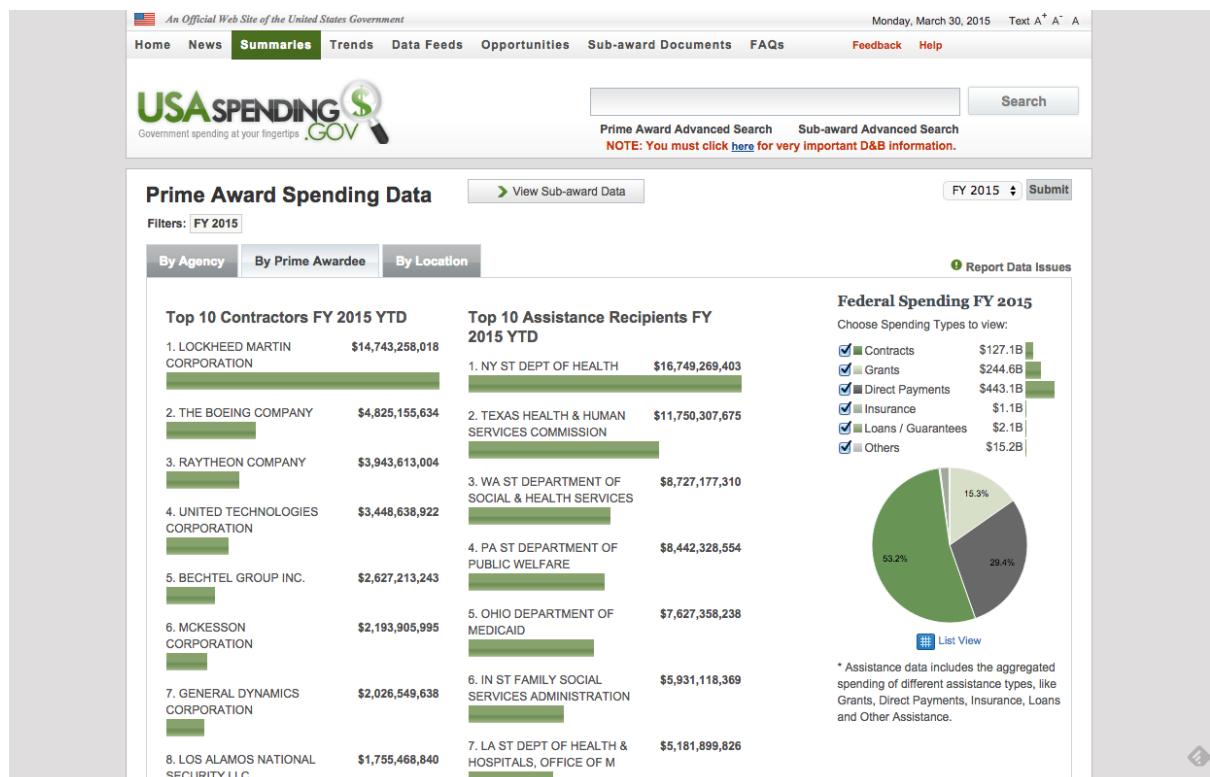
Geographical spending visualisations from Cameroon Budget Inquirer.

²³ See: <http://cameroon.openspending.org/> and <http://budget.data.cityofboston.gov/>

²⁴ See: <http://usaspending.gov/explore>

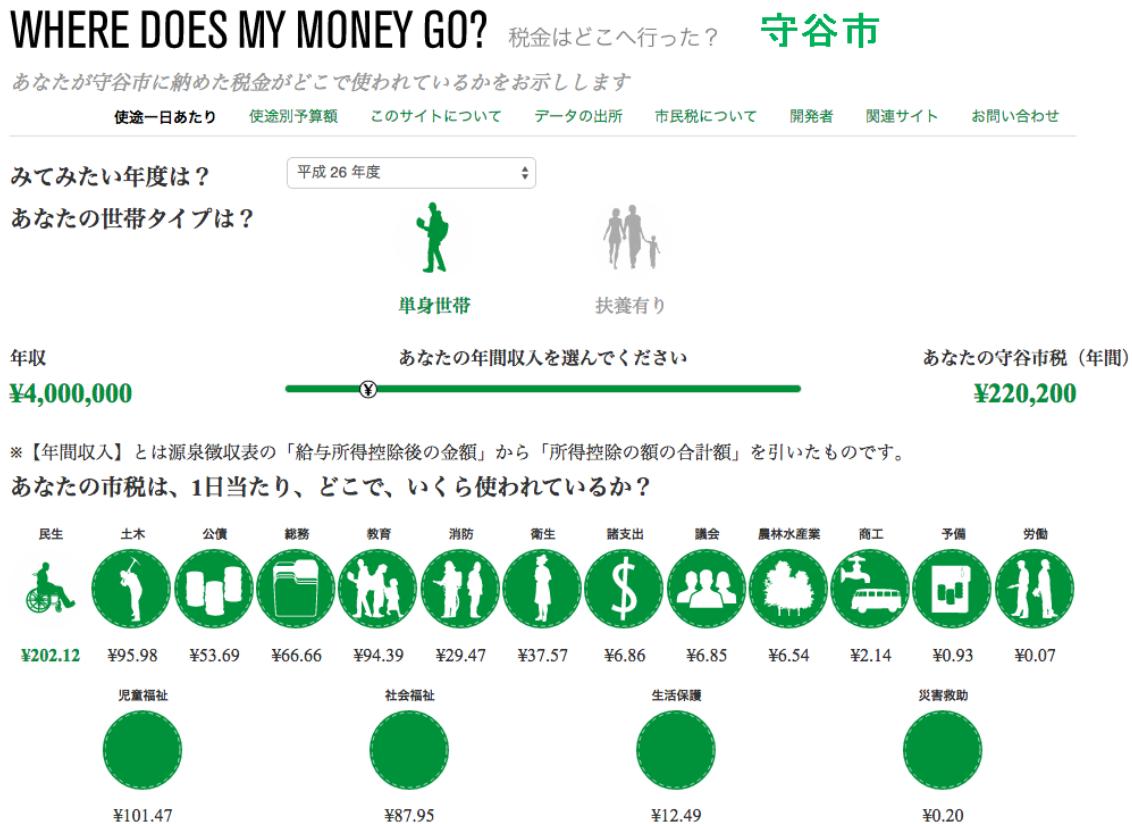


Geographical representation of project spending from the City of Boston.



Charts showing top contractors and recipients of US Federal Government funds from USA Spending.gov website.

Some visualisations aim to help make fiscal spending information easier to understand - through things like personalisation and contextualisation features. For example, the Where Does My Money Go? "Daily Bread" visualisation, lets users select their income with a slider, and then explore their equivalent "per day" contributions to spending in different areas.²⁵ To provide another way of making large public spending transactions more comprehensible, the Spending Stories project displays them in the context of news stories about other similar sized transactions.²⁶

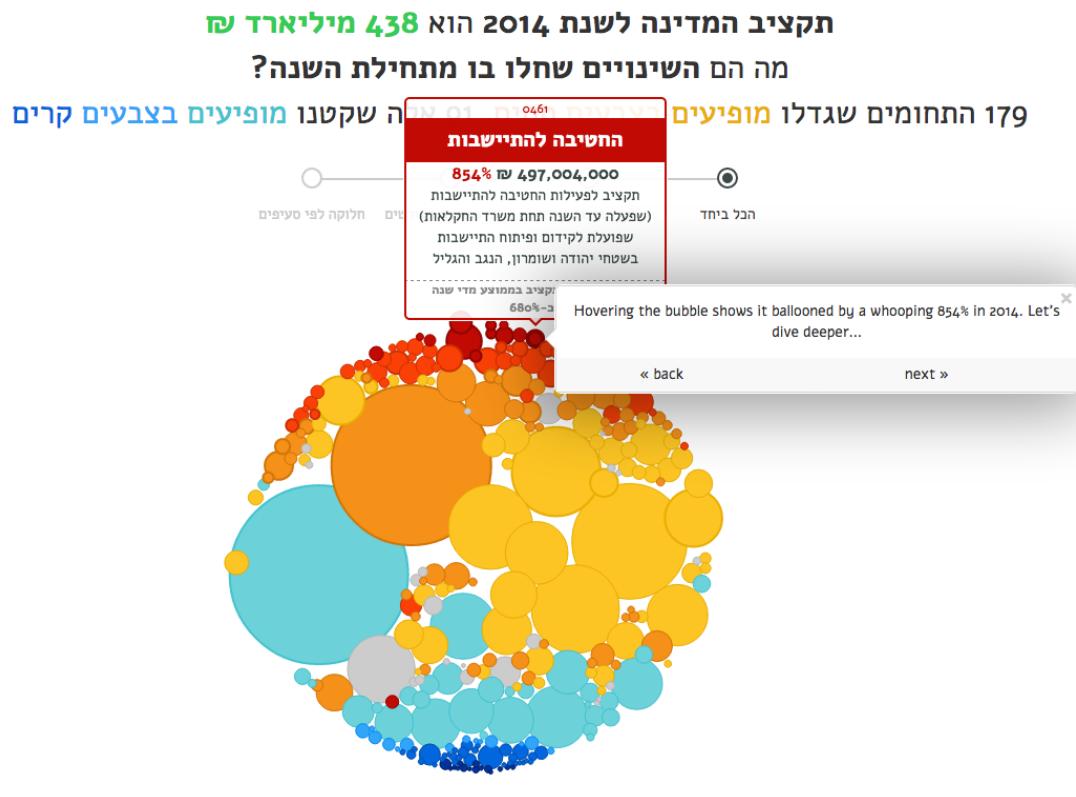


²⁵ See: <http://wheredoesmymoneygo.org/>

²⁶ See: <http://spendingstories.org/>

CITIZEN BUDGET MONITORING

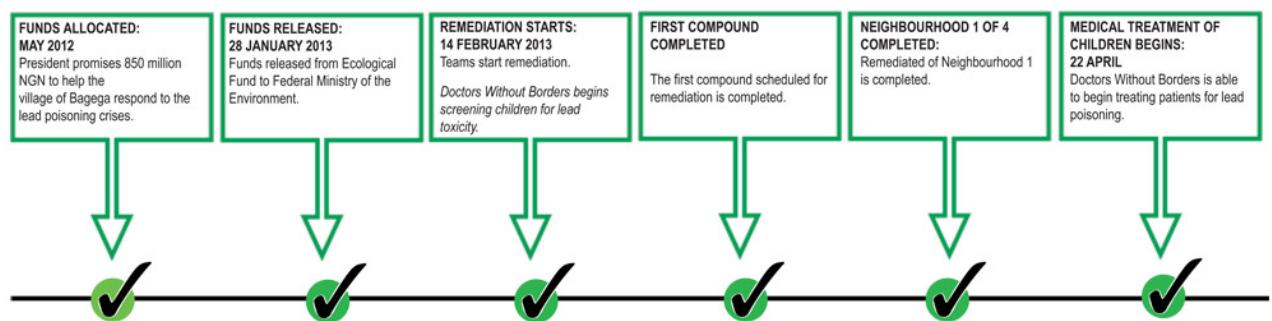
As well as equipping citizens with a general overview of public finances and the means to explore further through interactive data visualisations, we found several open budget data projects which explicitly support more active citizen and civil society monitoring of public finances. For example, the Israeli Open Budget project encourages users to look for anomalies in fiscal information and says that “by design” its project aims to draw “attention to abnormal spikes and plunges, inviting further digging and research”.²⁷ A walkthrough of the project focuses on cases of spending on settlements which are orders of magnitude larger than committed funds, the disbursement of which, the project argues, “bypasses and circumvents parliament”. They hope that the site may help to flag potential cases of bribery and corruption, making it “harder to hide” wrongdoing around public funds.



The Israeli Open Budget project uses data visualisations to highlight discrepancies between planned spending commitments and actual expenditures.

²⁷ See: <http://the.open-budget.org.il/>

The Follow the Money project in Nigeria is a network of activists, journalists, researchers, civil society groups and others using open budget data to “track and visualize” flows of public money.²⁸ They successfully campaigned to have \$5.3 million released by the Nigerian government to support environmental decontamination and medical treatment in the village of Bagega after a lead poisoning incident that affected thousands of children (Lawal & Babayemi, 2012; Treisman, 2013). They have also worked on a variety of citizen monitoring campaigns to follow public money committed to improving educational institutions, helping flood victims and purchasing cooking stoves for rural populations. The project offers free “data expedition” workshops to help with “visualizing, interpreting, and communicating” data for advocacy purposes.



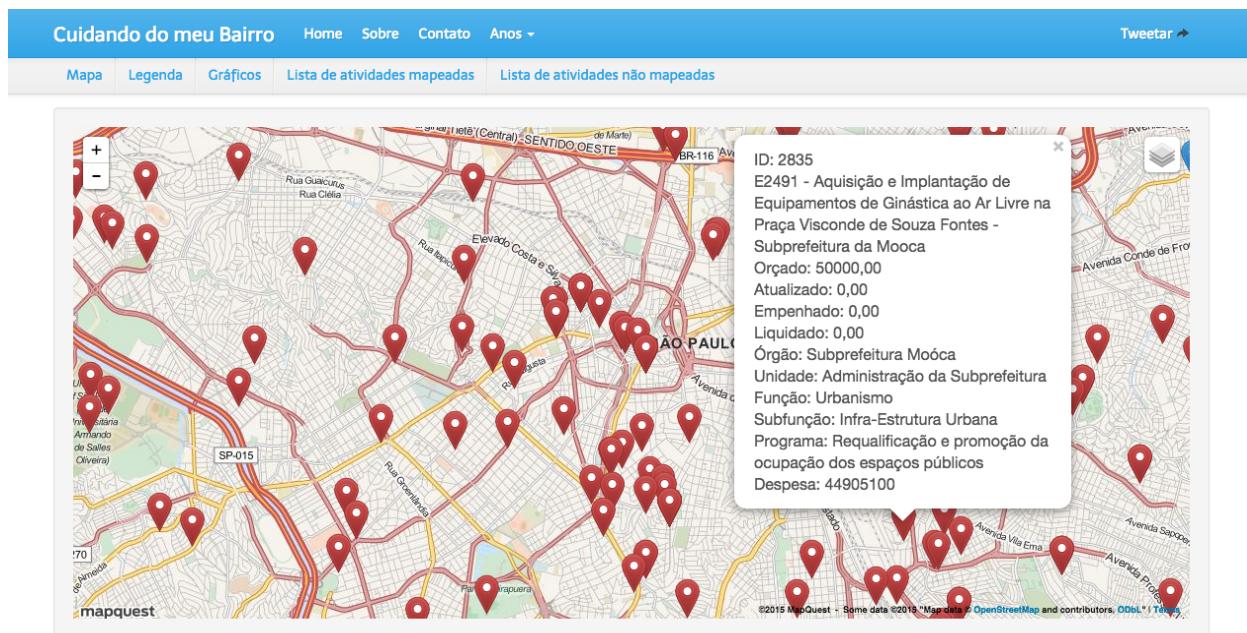
Graphic from Nigerian Follow the Money project showing campaign progress from commitment of funds to medical treatment of children.

The *Cuidando do meu Bairro* (Taking Care of My Neighbourhood) project in São Paulo, Brazil, aims to “provide a tool for citizens to exert social control and oversee individual expenses in the public facilities of their cities” (Craveiro & Martano, 2015, p. 118).²⁹ The project geocodes transactions from city expenditure data so that citizens are able to see how public money is spent (or not spent) on facilities around them. The Nigerian BudgiT project has also created another application to check funding commitments through to results.³⁰

²⁸ See: <http://www.followthemoneyng.org/>

²⁹ See: <http://cuidando.org.br/>

³⁰ See: <http://www.yourbudgit.com/>



Geolocated spending items in São Paulo from the Cuidando do meu Bairro project.

FOLLOWING THE MONEY IN JOURNALISM

Only a small handful of journalistic projects showed up in our mapping of initiatives associated with open budget data. Several of these were about EU funds. The Farm Subsidy project, run by “a network of European journalists, researchers and activists”, aims to “obtain detailed data relating to payments and recipients of farm subsidies in every EU member state and make this data available in a way that is useful to European citizens”.³¹ Specifically they undertook to create a unified database of EU agricultural subsidies, by reformatting, standardising and piecing together documents and datasets scattered across dozens of different websites, and to create a network of journalists reporting on the subsidies to encourage cross-border investigative collaborations. To date the project has led to over 120 pieces of media coverage from outlets around the world, including breaking major stories and leading to criminal investigations.³² One of the project’s co-founders, Jack Thurston, commented that the project enabled the journalists to see that “again and again [...] the bulk of the money is going to big companies and wealthy landowners” (The Telegraph, 2009).

³¹ See: <http://farmsubsidy.openspending.org/>

³² See: <http://farmsubsidy.openspending.org/news/media/> and <http://eutransparency.org/a-family-affair/>

NESTLE UK LTD (771234)

NESTLE UK LTD (771234) is a recipient of farm subsidies in York, United Kingdom.

Since 1999 NESTLE UK LTD (771234) has received **€93,126,292** in payments from the European Union .

Details of payments

Year	Scheme	Total
2005	SPS (single payment scheme)	€4,371,658
2005	Refunds on non-Annex 1 products (sugar)	€2,337,496
2005	Refunds on non-Annex 1 products (milk and butter)	€692,912
2005	Refunds on non-Annex 1 products	€81,267
2005	Other measures (other plant products/measures)	€-9,624
2005	Recoveries	€-21,832
2004	SPS (single payment scheme)	€12,161,468
2004	Refunds on non-Annex 1 products (sugar)	€3,544,571

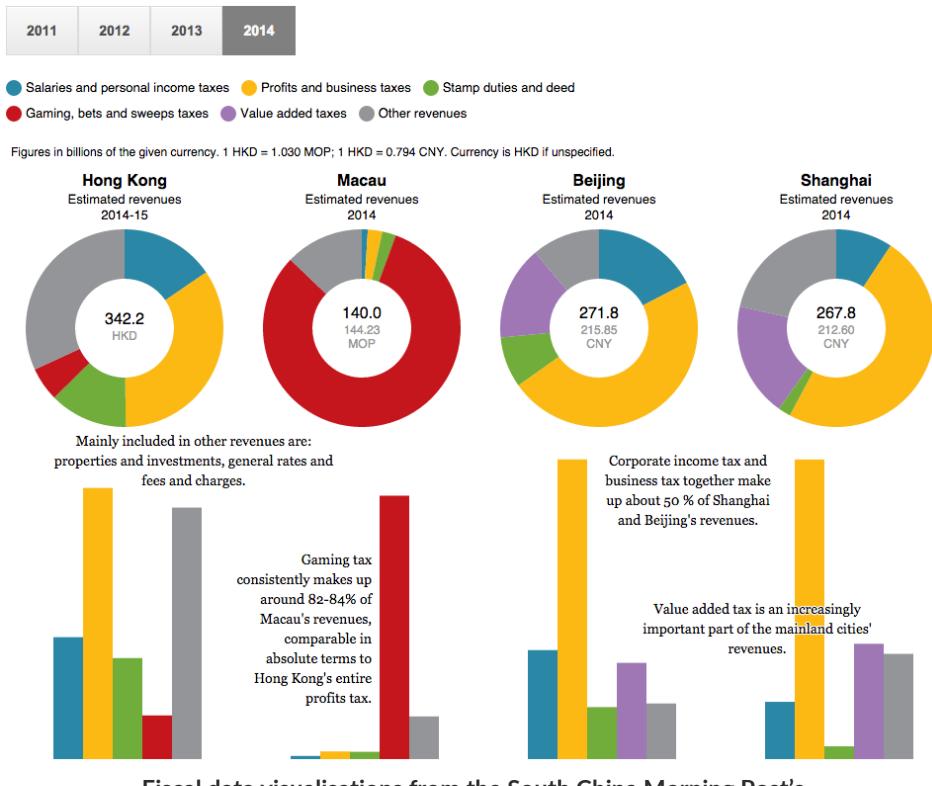
Browsing EU Common Agricultural Policy (CAP) funds with the Farm Subsidy project.

In a similar vein, The Bureau of Investigative Journalism and the Financial Times also collaborated on a data journalism project using fiscal information to create “the only comprehensive database tracking every penny distributed through the EU’s Structural Funds to date” (The Bureau of Investigative Journalism, 2010). The EU Structural Funds were the second biggest funding source in Europe, after the CAP funds. Their investigation highlighted several cases of corruption and misuse of the funds, and resulted in “five days of coverage in the Financial Times and the BIJ, a BBC radio documentary, and several TV documentaries” (O’Murchu, 2012).

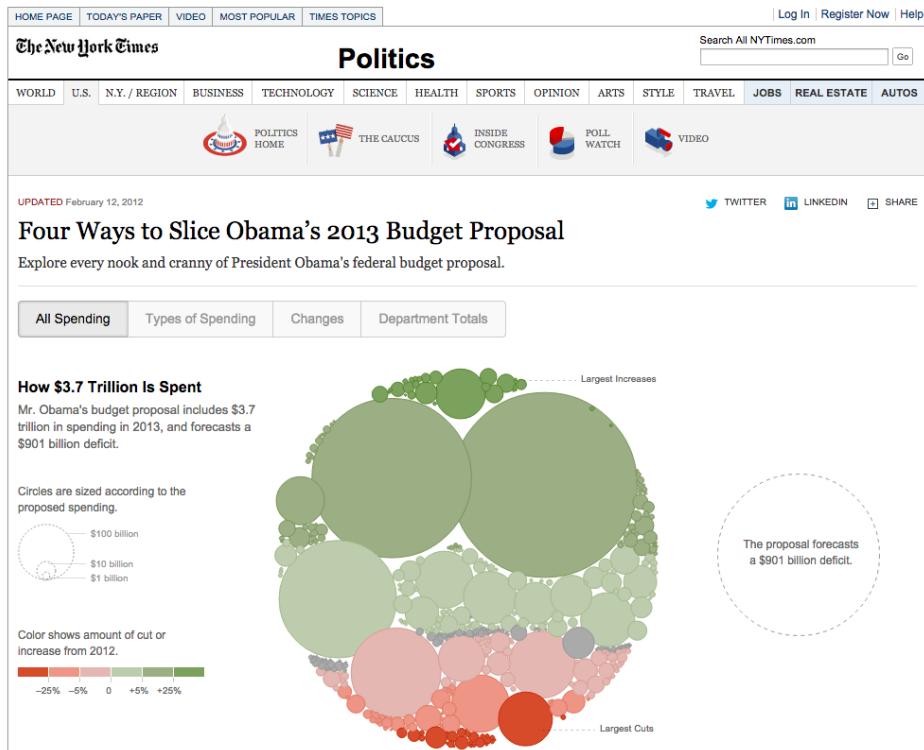
As well as fiscal information being used in the service of journalistic investigations, we also encountered several media outlets using open budget data to create data visualisations and interactive projects. For example, the South China Morning Post’s “Deconstructing the 2014-15 Hong Kong Budget” gave an interactive walkthrough of both revenues and expenditures.³³ Fiscal data projects from The New York Times enabled users to explore Obama’s 2013 budget proposal, as well as a game to make cuts to close “budget gaps for both 2015 and 2030”.³⁴

³³ See: <http://www.scmp.com/infographics/article/1438790/deconstructing-hong-kong-budget>

³⁴ See: http://www.nytimes.com/interactive/2012/02/13/us/politics/2013-budget-proposal-graphic.html?_r=0 and http://www.nytimes.com/interactive/2010/11/13/weekinreview/deficits-graphic.html?_r=1&



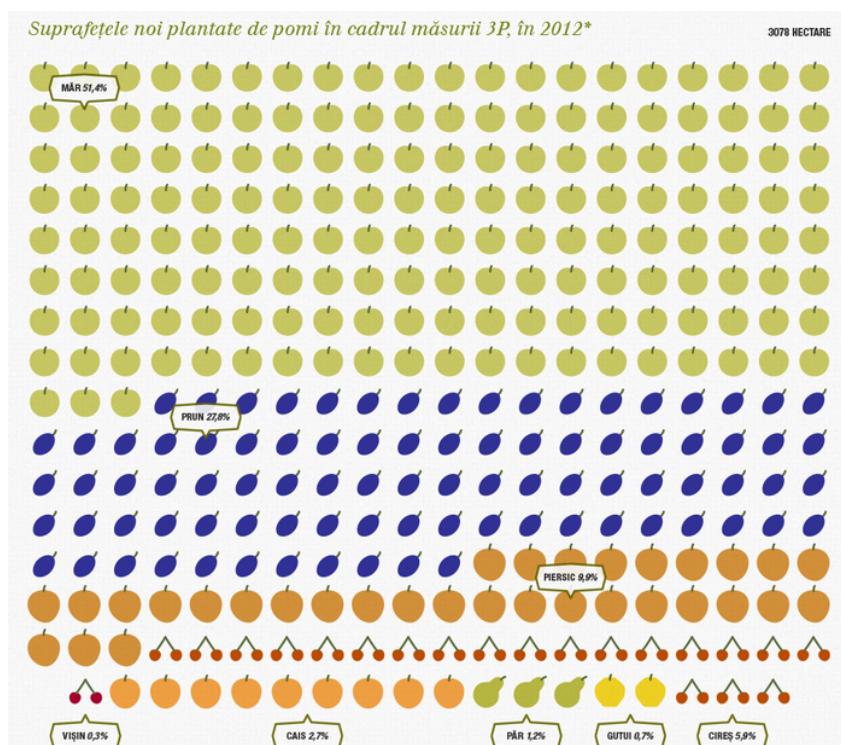
Fiscal data visualisations from the South China Morning Post's "Deconstructing the 2014-15 Hong Kong Budget" project.



Interactive visualisation of Obama's 2013 budget proposal in The New York Times.

DATA FOR ADVOCACY

Finally, our empirical work tracing the issue of open budget data on digital media led us to several projects using fiscal information in the service of advocacy around a range of different causes. The Government Spending Watch project from Oxfam and Development Finance International (DFI) tracks expenditure on the Millennium Development Goals, and advocates for increased investments around sectors such as health, education, water, sanitation, the environment, gender and social protection.³⁵ The project assembles data from governments and civil society organisations, including from sources which were not previously available on the web.



Infographic from Budget Stories showing agricultural subsidies for different kinds of fruits.

The Moldovan Budget Stories project uses open data to advocate for “more efficient spending of public money” through the creation and dissemination of accessible and freely reusable infographics.³⁶ The Brazilian Orçamento ao seu Alcance (Budget at Your Fingertips) project advocates for spending allocations which “promote human rights, reduce social inequalities and ensure environmental sustainability”, as well as more progressive taxation policies to challenge a system which they describe as “regressive and unfair” such that “the poor pay proportionately more taxes than the rich”.³⁷ In another initiative, geocoded data was used to highlight recurrent underinvestment in one of Nepal’s poorest regions, which subsequently led to fairer resource allocations from donors (InterAction, 2014).

³⁵ See: <http://www.governmentspendingwatch.org/>

³⁶ See: <http://www.budgetstories.md/>

³⁷ See: <http://orcamento.inesc.org.br/>

FINDINGS

Our analysis of projects associated with the issue of open budget data highlighted four main types of uses: data visualisations to improve public understanding of public finances, citizen budget monitoring, following the money in journalism and data for advocacy.

The largest proportion of projects that we examined (over 65%) fell into the first category, with only a handful of projects for each of the other three categories. We undertook a brief analysis of a variety of data visualisation projects in order to illustrate some of their different features and functions. These included giving a top-level overview of expenditures and revenues, contextualising transactions, showing trends over time, plotting spending projects on maps, highlighting top contractors and beneficiaries, and giving personalised views of public finances. We also surveyed some of the aspirations and impacts of projects in the other three categories.

While a more detailed and comprehensive analysis of the impacts of projects using open budget data is beyond the scope of this initial mapping report, we think that further work in this area is needed to better understand how these projects are being used, by whom, to what end, and to what extent they are achieving their objectives.

David Heald comments that a common “fundamental obstacle” to “effective fiscal transparency” is what he describes as the problem of “missing users” (Heald, 2003, 2012). It would be highly valuable to understand to what extent this might also be an issue for the uptake of budget data, as well as for the uptake of projects which use it. Previous empirical work in this area suggests that the audiences for data about public finance may be much more limited than sometimes hoped (Worthy, 2013; Kim et al., 2015). In any case, in addition to further research on the impacts of open budget data, we believe that a sharper and more granular perspective on the current and potential future users of open fiscal data projects would be a welcome contribution to work in this area - not least as this may help to inform and clarify thinking around data release priorities as well as realistic “accountability pathways” commensurate with the desired outcomes.

CONCLUSIONS AND RECOMMENDATIONS

In this study we have undertaken a mapping of issues, initiatives, actors, definitions and best practices associated with the emerging issue of open budget data in different forms of digital media – from social media platforms to search engine results.

Through this research we found that there is relatively strong consensus around definitions and best practices for open budget data. Its most visible stakeholders are international organisations – including IGOs and global CSOs. Amongst the wide variety of different issues and arguments associated with it, the most popular are technical in nature. Data visualisation appeared to be the most prevalent genre of usage in the sample of initiatives that we examined.

We also found that more substantive social and political issues around fiscal policy (from tackling inequality to tax justice) appear to be comparatively marginal in the field of open budget data. The range of civil society groups represented remains limited to mainly larger international organisations, with much sparser representation from local groups or organisations who are not mainly focused on transparency in their work. Explicit “accountability paths” and theories of change appear to be relatively under-developed. Hence we propose the following.

1. CSOs, IGOs, multilaterals and governments should undertake further work to **identify, engage with and map the interests of a broader range of civil society actors** whose work might benefit from open fiscal data, in order to inform data release priorities and data standards work. Stronger feedback loops should be established between the contexts of data production and its various contexts of usage in civil society – including in journalism and in advocacy.
2. Governments, IGOs and funders should support **pilot projects undertaken by CSOs and/or media organisations** in order to further explore the role of data in the democratisation of fiscal policy - especially in relation to areas which appear to have been comparatively under-explored in this field, such as tax distribution and tax base erosion, or tracking money through from revenues to results.
3. Governments should work to make data “**citizen readable**” as well as “**machine readable**”, and should take steps to ensure that information about flows of public money and the institutional processes around them are accessible to non-specialist audiences – including through documentation, media, events and guidance materials. This is a critical step towards the greater democratisation and accountability of fiscal policy.

4. Further research should be undertaken to explore the potential **implications and impacts of opening up information about public finance which is currently not routinely disclosed**, such as more detailed data about tax revenues – as well as measures needed to protect the personal privacy of individuals.
5. CSOs, IGOs, multilaterals and governments should work together to **promote and adopt consistent definitions of open budget data, open spending data and open fiscal data** in order to establish the legal and technical openness of public information about public money as a global norm in financial transparency.

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The following list is of publications and documents that are referred to in this report. As part of our research we conducted a more extensive review of existing literature, which we compiled into an online bibliography, available at: https://www.zotero.org/groups/open_fiscal_data

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<http://papers.ssrn.com/abstract=2012489>

APPENDIX

METHODOLOGY

“SEARCH AS RESEARCH”

To map projects and issues associated with open budget data on the web we utilised tools and methods pioneered at the Digital Methods Initiative to repurpose traces derived from digital devices as evidence for our research. For this part of the project we drew on an approach dubbed “search as research” (Rogers, 2013a, p. 95-124).

We started with a search engine query for “open budget data” on Google.com obtained on 7th March 2015 with a dedicated research browser with personalisation features disabled.³⁸ The Harvester tool was used to extract URLs for the Google results, which were manually checked.³⁹ We then undertook a content analysis, categorising the query results through an open coding process (Corbin & Strauss, 2015), as well as classifying them by sector and by country of operations . This resulted in 146 results pages coded for 64 categories. We also derived the names and URLs of initiatives associated with open budget data through this process.

Next we filtered out the results which didn’t explicitly include the phrase “open budget data” in the page content (for example as the phrase may have been included via the indexing of mentions through RSS or social media aggregation). This left us with 90 results. We used pivot tables to derive an overview of the sectors and countries of operations for the results. Pivot tables and Stanford University’s Data Wrangler tool were used to convert the matrix table into a bipartite network graph file.⁴⁰

The resulting table was imported into Gephi, an open source network analysis and visualisation tool, as an edge table.⁴¹ The open budget data node was removed as it was present for all selected results. The network of countries and issues was spatialised with the Force Atlas 2 algorithm on the following settings: Ling Long mode on, prevent overlap, edge influence: 1, scaling: 10, gravity: 6. The nodes were sized according to the Weighted Degree Metric. For the network showing sectors and issues, the following settings were used: Ling Long mode, prevent overlap, edge influence: 0.8, scaling: 13, gravity: 6. The resulting network graphs were then exported from Gephi and imported into Illustrator to improve their readability.

³⁸ For further details, see: <https://wiki.digitalmethods.net/Dmi/FirefoxToolBar>

³⁹ See: <https://tools.digitalmethods.net/beta/harvestUrls/>

⁴⁰ See: <http://vis.stanford.edu/wrangler/>

⁴¹ See: <https://gephi.github.io/>

HYPERLINK ANALYSIS

To explore the “politics of association” between organisations who are active around open budget data we undertook a hyperlink analysis using the Issue Crawler tool (Marres & Rogers, 2005; Rogers, 2013b).⁴² We started with an initial list which included all organisations who were members of at least two of the following lists, derived using the Digital Methods Initiative’s Triangulate tool⁴³:

- Expert organisations for the “Budgets” section of the Open Government Guide (Transparency and Accountability Initiative, 2014);
- Organisations listed as key initiatives and partners of the World Bank’s Open Budgets Portal (part of the BOOST initiative to “facilitate access to budget data”);
- Organisations included in the top 100 results for the search queries for “open budget data” on 7th March 2015 using a research browser with depersonalised user profile (as per above);
- Organisations included in the top 100 results for the search queries for "open budgets" on 7th March 2015 using a research browser with depersonalised user profile (as per above);
- Organisations who used the #openbudgets hashtag on Twitter, based on Twitter advanced search, January 2014 to January 2015.

The URLs for these initiatives were used as the seed links for a co-link crawl with the Issue Crawler, with settings as follows: privilege starting points on, perform co-link analysis by page, 1 iteration, crawl depth 2. The resulting network file was analysed and graphed with Gephi, and exported to Illustrator for design.

TWITTER DATA

Given that Twitter was identified as a significant medium of communication through our hyperlink analysis (see above), we decided to use Twitter to further explore which actors and issues are prominent around the open budget data agenda. To obtain data for our Twitter analysis we used the Twitter Capture and Analysis Toolset (TCAT) developed by the Digital Methods Initiative (Borra & Rieder, 2014). Data was captured via the Twitter streaming API over a 30 day period, from Thursday 19th February until Friday 20th March 2015, by searching for the following key terms: 'open budget data', 'open budget', 'open budgets', 'open fiscal data', 'open spending data', 'open spending', #makebudgetspublic, #openbudgets, #opencontracts and #openspending. We then visualised the resulting data using Gephi.

We opted to examine which issues around open budget data were gaining traction with whom through the study of relationships between hashtags in this collection - through both a co-hashtag analysis and a user-hashtag analysis (Bruns & Stieglitz, 2013; Weller, Bruns, Burgess, Mahrt, & Puschmann, 2013).

⁴² See: <https://www.issuecrawler.net/>

⁴³ See: <https://tools.digitalmethods.net/beta/triangulate/>

To generate the hashtag co-occurrence network the undirected co-hashtag network graph file based on co-word analysis of hashtags was exported from TCAT and imported into Gephi. The modularity class metric was used to detect hashtag clusters. Nodes representing hashtags were sized according to the weighted degree metric. The network was spatialised using the Force Atlas 2 algorithm with the following settings: Dissuade Hubs on , Prevent Overlap on, Edge Weight Influence: 1, Scaling: 7, Gravity: 9. The Label Adjust algorithm was launched in order to resize labels and make the network more readable.

To generate the user-hashtag network, the bipartite user-hashtag network graph file based on co-occurrence of hashtags and users was exported from TCAT and imported into Gephi. Nodes were resized according to their weighted degree and nodes with a weighted degree smaller than 3 and larger than 40 were filtered out. The network was spatialised with the Force Atlas 2 algorithm with the following settings: 'prevent overlap' on, 'ling long mode' on, scaling: 10, gravity: 13.

To generate the followee network we extracted the accounts followed by the Twitter accounts of our initial list of actors (as per above) using a custom script. The result is a bipartite network graph file (.gdf) where one type of node represents the initial list of open budget actors (as per above) and the other type represents their followees (Twitter accounts which they follow). The network file was imported into Gephi. The nodes were ranked according to indegree (the number of connections which they receive) and only nodes with a minimum of 5 and a maximum of 16 connections were retained. The network was spatialised with the Force Atlas 2 algorithm⁴⁴ and the following settings: 'Dissuade Hubs' on, 'Prevent Overlap' on, Scaling = 15, Gravity = 5.

⁴⁴ <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0098679>

STARTING LISTS OF ACTORS

Lists colored by frequency, ordered by frequency and alphabet

[1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [12](#)

Google query: "open budget data"	Google query: "open budgets"	Twitter: #openbudgets	Open Government Guide: Budgets	World Bank BOOST Partners
http://internationalbudget.org/	http://internationalbudget.org/	http://internationalbudget.org/	http://internationalbudget.org/	http://internationalbudget.org/
http://fiscaltransparency.net/	http://okfn.org/	http://worldbank.org/	http://fiscaltransparency.net/	http://fiscaltransparency.net/
http://okfn.org/	http://worldbank.org/	http://globalbtap.org/	http://cabri-sbo.org/	http://okfn.org/
http://worldbank.org/	http://aiddata.org/	http://opengovhub.org/	http://globalbtap.org/	http://opengovpartnership.org/
http://aiddata.org/	http://ec.europa.eu/	http://openspending.org/	http://oecd.org/	http://sidtransparency.net/
http://cabri-sbo.org/	http://freedominfo.org/	http://publishwhatyoufund.org/	http://imf.org/	http://gatesfoundation.org/
http://ec.europa.eu/	http://odi.org/	http://evidence4action.net/	http://pefa.org/	http://odi.org.uk/
http://freedominfo.org/	http://ogphub.org/	http://followthemoneyng.org/		
http://odi.org/	http://one.org/	http://globalintegrity.org/		
http://oecd.org/	http://opengovguide.com/	http://makingallvoicescount.org/		
http://ogphub.org/	http://opengovhub.org/	http://opengovmanifesto.org.uk/		
http://one.org/	http://opengovpartnership.org/	http://openinstitute.com/		
http://opengovguide.com/	http://openspending.org/	http://yourbudget.com/		
http://weforum.org/	http://publishwhatyoufund.org/			
http://africadata.org/	http://weforum.org/			
http://apec.org/	http://access-info.org/			
http://blog-pfm.imf.org/	http://accountability.or.tz/			
http://caribbeanopeninstitute.org/	http://africanliberty.org/			
http://cef-seo.org/	http://agora-parl.org/			
http://codeforsacramento.org/	http://brookings.edu/			
http://datadrivenjournalism.net/	http://cambodianbudget.org/			
http://dbm.gov.ph/	http://corruptionresearchnetwork.org/			
http://github.com/openbudget	http://citi.org/			
http://hawaiiopendata.com/	http://epsiplatform.eu/			
http://hfgproject.org/	http://eutanparency.org/			
http://iadb.org/	http://fazenda.sp.gov.br/			
http://iati.org/	http://fspi.org.fj/			
http://ifex.org/	http://github.com/openbudgets			
http://indigitrust.org.uk/	http://gov.uk/			
http://interaction.org/	http://integrityflorida.org/			
http://knightfoundation.org/	http://openbudgets.io/			
http://losangeles.opengov.com/	http://opengovernment.org.uk/			
http://make.opendata.ch/	http://p2pfoundation.net/			
http://okfn.de/	http://pacificopendata.com/			
http://open-contracting.org/	http://thegovlab.org/			
http://open-data.fokus.fraunhofer.de/	http://transparency-initiative.org/			
http://openaidmap.org/	http://twaweza.org/			
http://opendataday.org/	http://undp.org/			
http://opendataresearch.org/				
http://opennepal.net/				
http://pempal.org/				
http://pfm.gov.ph/				
http://ri.gov/opengovernment/				
http://socrata.com/				
http://sunlightfoundation.com/				
http://temenaoecd.org/en/				
http://ti-ukraine.org/				
http://transparency.org/				
http://u4.no/				
http://webfoundation.org/				

LIST OF INITIATIVES FROM MAPPING

The following list of initiatives were derived from our mapping of open budget data on the web and social media.

Name	URL	Country	Sector
Aid Data	http://aiddata.org/	International	Civil Society
COINS - Alpine Interactive	http://alpine.coinsdata.co.uk/#/Coins	UK	Company
Canton of Berne, 2015 proposal	http://be-asp.budget.opendata.ch	Switzerland	Civil Society
Canton of Berne	http://be.budget.opendata.ch	Switzerland	Civil Society
Commune of Beringen	http://beringen.budget.opendata.ch	Switzerland	Civil Society
City of Berne	http://bern.budget.opendata.ch	Switzerland	Civil Society
Mapping for Results	http://blogs.worldbank.org/developmenttalk/mapping-for-results	International	IGO
Commune of Brig-Glis	http://brig-glis.budget.opendata.ch	Switzerland	Civil Society
City of Boston - Budget Data	http://budget.data.cityofboston.gov/#/	US	Government
Montgomery County Budget	http://budget.data.montgomerycountymd.gov/#/	US	Government
City of Hickory Open Data Initiative	http://budget.hickorync.gov/#/	US	Government
Government of Leningrad Budget	http://budget.lenobl.ru	Russia	Government
City of Moscow Budget	http://budget.mos.ru/	Russia	Government
Russian Government Budget	http://budget.open.gov.ru/	Russia	Government
Budget for Me	http://budget4me.ru	Russia	Civil Society
Offener Haushalt	http://bund.offenerhaushalt.de	Germany	Civil Society
Clear Spending Russia	http://clearspending.ru/	Russia	Civil Society
Guardian COINS explorer	http://coins.guardian.co.uk/coins-explorer/search	UK	Media
Cuidando do Meu Bairro (Caring for My Neighbourhood)	http://cuidando.org.br/	Brazil	Civil Society
COINS	http://data.gov.uk/dataset/coins	UK	Government
UK Government Spending	http://data.gov.uk/openspending	UK	Government
Commune of Eichberg SG	http://eichberg.budget.opendata.ch	Switzerland	Civil Society
Farm Subsidy	http://farmsubsidy.openspending.org/	EU	Civil Society
Follow the Money NG	http://followthemoneyng.org/	Nigeria	Civil Society
Open Budget Index	http://internationalbudget.org/what-we-do/open-budget-survey/	International	Civil Society
Factful	http://juhokim.com/files/CHI2015-Factful.pdf	South Korea	Research
Open Budget of Leningrad Region	http://lenobl2014.ru/	Russia	Civil Society
Offener Haushalt	http://offenerhaushalt.de/	Germany	Civil Society
Ohio Checkbook	http://ohiotreasurer.gov/Transparency/Ohio-Online-Checkbook	US	Government
Orçamento Participativo Digital 2008	http://opdigital.pbh.gov.br	Brazil	Government
Open Bank Project	http://openbankproject.com/	International	Civil Society
Town of Erie's Open Budget Application	http://openbudget.erieco.gov/#/	US	Government
OpenBudget.ny.gov	http://openbudget.ny.gov/	US	Government

Open Spending	http://openspending.org/	International	Civil Society
Orçamento ao Seu Alcance	http://orcamento.inesc.org.br/	Brazil	Civil Society
Recovery.gov	http://recovery.gov/	US	Government
Illinois Recovery Map	http://recoverymap.illinois.gov	US	Government
School District of Philadelphia Budget	http://schoolbudget.phl.io/	US	Civil Society
See Through NY	http://seethroughny.net/	US	Civil Society
Montgomery County Spending Data	http://spending.data.montgomerycountymd.gov/#/	US	Government
Stimulus Watch	http://stimuluswatch.org/2.0/	US	Civil Society
Stadt Bern Nettoausgaben Budget 2012	http://t.preus.se/bernbudget2012/	Austria	Civil Society
TED	http://ted.europa.eu	EU	Government
The Open Budget	http://the.open-budget.org.il/	Israel	Civil Society
Mastadon C, Open Health Care and Ben Goldacre	http://theodi.org/news/prescription-savings-worth-millions-identified-odi-incubated-company	UK	Civil Society
USASpending.gov	http://usaspending.gov/	US	Government
Visual Budget	http://visualbudget.ru/	Russia	Civil Society
BOOST	http://wbi.worldbank.org/boost/	International	IGO
Where Does My Money Go?	http://wheredoesmymoneygo.org	UK	Civil Society
City of Winterthur	http://winterthur.budget.opendata.ch	Switzerland	Civil Society
International Aid Transparency Initiative	http://www.aidtransparency.net/	International	Mulilateral
Bonn Packt's An	http://www.bonn-packts-an.de	Germany	Government
Uganda Budget Information	http://www.budget.go.ug/	Uganda	Government
Australian Government Budget	http://www.budget.gov.au	Australia	Government
Russian Government Budget	http://www.budget.gov.ru	Russia	Government
Budget Stories	http://www.budgetstories.md/	Moldova	Civil Society
Participatory Budgeting in Lichtenberg	http://www.buergerhaushalt.org/status/	Germany	Government
German Government Budget	http://www.bundeshaushalt-info.de	Germany	Government
Checkbook NYC	http://www.checkbooknyc.com/spending_landings/yearstype/B/year/116	US	Government
City of Palo Alto Budget	http://www.cityofpaloalto.org/gov/depts/asd/budget.asp	US	Government
Data Cards	http://www.controlpanel.la/cards	US	Government
Denver's Open Checkbook	http://www.denvergov.org/transparency	US	Government
Development Gateway - Aid Management Platform	http://www.developmentgateway.org/programs/aid-management-program/aid-management-platform	International	Civil Society
Bolivian Ministry of Economics and Public Finance	http://www.economia y finanzas.gob.bo	Bolivia	Government
Estonian Ministry of Finance	http://www.fin.ee	Estonia	Government
Kingdom of Morocco - Ministry of Economics and Finance	http://www.finances.gov.ma	Morocco	Government
Ecuador Ministry of Finance	http://www.finanzas.gob.ec	Ecuador	Government
Fish Subsidy	http://www.fishsubsidy.org/	EU	Civil Society
Jordanian Ministry of Finance	http://www.gfmis.gov.jo	Jordan	Government
Government Spending Watch	http://www.governmentspendingwatch.org/	International	Civil Society

SF Town Hall Feedback	http://www.govtech.com/internet/San-Francisco-Hosts-Online-Budget-Town-Hall.html	US	Government
Aid allocations in Nepal	http://www.interaction.org/blog/why-transparency-matters-part-4-does-it-really-make-difference	Nepal	Civil Society
IT Dashboard	http://www.itdashboard.gov	US	Government
K Monitor	http://www.k-monitor.hu/	Hungary	Civil Society
LA Mayor - Open Budget	http://www.lamayor.org/openbudget	US	Government
Ministry of Finance - Japan	http://www.mof.go.jp	Japan	Government
Ministry of Finance - China	http://www.mof.gov.cn	China	Government
Jordanian Ministry of Finance	http://www.mof.gov.jo	Jordan	Government
Ministry of Finance - Singapore	http://www.mof.gov.sg	Singapore	Government
Ministry of Finance - Vietnam	http://www.mof.gov.vn	Vietnam	Government
The Ministry of Finance and Economic Development - Mauritius	http://www.mof.mu	Mauritius	Government
Ministry of Strategy and Finance - Republic of Korea	http://www.mosf.go.kr	Korea	Government
NYC Citywide Performance Reporting	http://www.nyc.gov/html/ops/html/data/data.shtml	US	Government
NYT Budget Puzzle: You Fix the Budget	http://www.nytimes.com/interactive/2010/11/13/weekinreview/deficits-graphic.html?_r=0	US	Media
Four Ways to Slice Obama's 2013 Budget Proposal	http://www.nytimes.com/interactive/2012/02/13/us/politics/2013-budget-proposal-graphic.html?_r=0	US	Media
Open Aid Data	http://www.offene-entwicklungshilfe.de/	Germany	Civil Society
Open Aid	http://www.openaid.se/	Sweden	Government
Open Budget Index	http://www.openbudgetindex.org		Civil Society
Open Door	http://www.opendoor.ky.gov/	US	Government
Public Expenditure and Financial Accountability	http://www.pefa.org	International	IGO
Ministry of Planning - Brazil	http://www.planejamento.gov.br	Brazil	Government
Public Signals	http://www.publicsignals.com/	US	Civil Society
Public Spending	http://www.publicspending.net/	International	Civil Society
Rhode Island Government Spending	http://www.ri.gov/opengovernment/	US	Government
Schwarzbuch des Bundes der Steuerzahler	http://www.schwarzbuch.de/	Germany	Civil Society
Deconstructing the Hong Kong Budget	http://www.scmp.com/infographics/article/1438790/deconstructing-hong-kong-budget	China	Media
Solingen Spart	http://www.solingen-spart.de/	Germany	Government
Ministry of Finance - Norway	http://www.statsbudsjettet.no	Norway	Government
Texas Transparency	http://www.texastransparency.org/	US	Government
EU's hidden billions	http://www.thebureauinvestigates.com/2010/11/29/top-story-4/	EU	Media
Guardian - MPs' Expenses	http://www.theguardian.com/politics/mps-expenses	UK	Media
Norwegian Ministry of Finance - Budget Pages	http://www.ungokonomi.no	Norway	Government
Where Did My Tax Go?	http://www.wheredidmytaxgo.co.uk/	UK	Civil Society

Window on State Government	http://www.window.state.tx.us/recovery/	US	Government
BudgiT	http://yourbudgit.com/	Nigeria	Company
City of Zurich	http://zurich.budget.opendata.ch	Switzerland	Civil Society
Bullhead City Budget	https://bullheadcity.opengov.com/transparenc y	US	Government
Control Panel LA	https://controllerdata.lacity.org/	US	Government
Federal Spending Transparency	https://fedspendingtransparency.github.io/	US	Government
City of Fort Lauderdale Budget	https://fortlauderdalefl.opengov.com/transparenc y	US	Government
Arizona General Accounting Office	https://gao.az.gov/financials/	US	Government
Budget Data Package	https://github.com/openspending/budget- data-package	International	Civil Society
City of Los Angeles	https://losangeles.opengov.com/	US	Government
City of New Haven Budget	https://newhavenct.opengov.com/transparenc y	US	Government
Open Corporates	https://opencorporates.com/	International	Company
Open Spending - Budget of Leningrad	https://openspending.org/lenobl2014	Russia	Civil Society
EU Aid Explorer	https://tr- aid.jrc.ec.europa.eu/MainHomePageAction.do	EU	Government
The Tax Tree	Not found	UK	Civil Society
Harrow Open Budget	Not found	UK	Civil Society
Friedrichshafen Open Budget	Not found	Germany	Government

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